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Conservation

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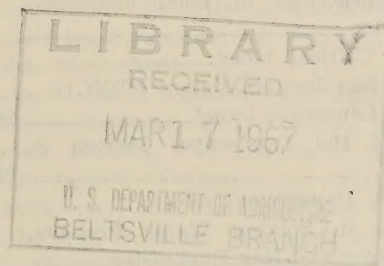
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SOIL CONSERVATION SERVICE

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Soil Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

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SOIL CONSERVATION SERVICE

U. S. DEPARTMENT OF AGRICULTURE





Soil Conservation

Devoted to the wise use of land and water resources

AUGUST 1965

VOL. 31, NO. 1

Land . . .

This issue of *Soil Conservation* begins a new volume—our thirty-first.

A generation of growth has carried the conservation movement beyond our original objective of soil erosion control. We are concerned now with all the related resources that comprise the landscape as a whole—soil, water, plants, and animals—in productive and pleasing combinations for the use of people.

So we take this occasion to add the line, "Devoted to the wise use of land and water resources," to our logotype.

Plants: SCS's far-flung search for conservation plants takes a new turn with the current interest in recreational and esthetic values in land use. Plant materials specialists tallied an imposing list of examples for Don Douglas' roundup (p. 3) of contributions in the making and already made to landscape beautification.

Jobs: Play makes work, rural communities are finding as land owners put their acres to recreational use. Our man in the Northeast, Les Fox, gives us a hearty sampling (p. 6) of new recreation jobs in that region.

Cover: A quarter-mile of rose hedge surrounds a 2-acre pond and grass covers the dam to make a pleasing setting for a family outing on the Edward L. Kothe farm in the Randolph Soil Conservation District, Ill.

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Editor

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Cardinal autumn-olive produces an abundance of fruits for song and game birds. It has attractive form and interesting gray-green foliage.

Conservation Plants For New Land Uses

TODAY's changing agriculture requires imaginative new uses of land and plants.

While soil conservationists spend an increasing portion of their time helping landowners plan new recreation areas and wildlife habitats to replace crop fields and pastures, a corps of SCS plant materials specialists, working with State experiment stations and colleges, are coming forth with new plants to meet the specialized needs of the new enterprises.

And new ways of using old plants are finding important places for them in rural landscapes managed for enjoyment as well as production.

The early work of SCS plant materials centers was aimed largely at producing improved forage plants that would give both soil protection and profitable production on specific sites. Out of these efforts came such now-well-known grasses as the southern bromes for the Corn Belt, Kentucky 31 tall fescue for the Southeast, and Manchurian smooth brome for the Northwest—these and others that made possible a grassland revolution in American agriculture.

For the special needs of the wind-whipped Great Plains, the plant materials centers found

Landscape beauty and recreation take priority in today's search for improved plant materials

By Donald S. Douglas

Plant Materials Specialist, SCS, Washington, D. C.

adapted shrubs and trees for shelterbelts and developed strains of native grasses for seeding rangeland.

They introduced and tested specialized plants to solve many spectacular and different conservation problems and encouraged commercial growers and nurserymen to produce the seed and plants.

Alkaline tall wheatgrass, for example, did well on saline land, Emerald crownvetch on roadsides, and Loredale canarygrass on streambanks. American beachgrass and European beachgrass were introduced to common use to protect coastal dunes.

Now the values of wildlife and recreation for profit and the objective of beautifying the landscape in every direction are given

high priority. These purposes require the adaptation of plants to new uses and the search for new sources of plant materials.

An early product of this search was Sodar wheatgrass, developed in the West as a low-growing drought-tolerant turf grass for roadside planting, farm airports, and dryland lawns. Durar hard fescue is a tufted, fine-leaved grass similar to chewing fescue but more drought tolerant and shade tolerant. When used on roadsides, for recreation area turf, or as a companion grass with alfalfa, it makes a good ground cover and keeps out weeds. When used as a turf, it produces long lax leaves and few seed heads. It is a heavy producer of fibrous roots, holding the soil firmly in place.

Two new forage plants that are



Chemung crownvetch covers raw strip-mine spoil in West Virginia. Later in the season this legume becomes a colorful mass of pinkish bloom.

fruit and nesting cover.

Lana vetch in California and Oregon concentrates mourning doves in the hunting season.

In the South sawtooth oak and runner oak are in the final testing stages as dependable sources of acorns for turkeys and squirrels.

Seeds which resist decay when inundated make a plant useful for waterfowl food. Browntop millet, barnyard grass, and pale ladythumb (*Polygonum lapathifolium*) seeds stay firm when the shooting ground is flooded. Shooting clubs and preserves represent an alternate and profitable use for land.

Similarly, plants for recreation are as varied in characteristics as their purposes. Pensacola bahiagrass in the Southeast and Durar hard fescue in the North are turf grasses useful for roadsides, camp grounds, and trailer parks. Both require a minimum of mowing and maintenance, and both are shade

proving of value for big game in the Northwest are Cicar milkvetch and Onar sainfoin. Elk and deer prefer them to alfalfa for grazing.

Several plant materials centers are working cooperatively with State game departments testing food plants for waterfowl and up-

land birds.

They have developed a technique of planting switchgrass providing release cover for birds on shooting preserves in the Northeast.

Amur honeysuckle is proving valuable as emergency winter food and cover for birds in the Midwest.

Cardinal autumn-olive, recently released to nurserymen in the Northeast and Midwest, attracts song birds in summer with its

Durar hard fescue forms a tough turf that excludes weeds and produces few seed heads.



Lana vetch cascading down a flood-control dam and draping gracefully over the outlet structure provides permanent soil protection as well as a blaze of color when in flower.



Beachgrass traps the shifting sand and continues to grow through the accumulation. It is used to stabilize dunes.

tolerant. Durar hard fescue is especially valuable for holding and suppressing brush on ski slopes.

A recent publication by Washington State University, "Adaptation of Trees and Shrubs for the Intermountain Area of the Pacific Northwest," describes the cooperative testing of woody plants for wildlife, recreation, and conservation plantings. Some of the native plants found adapted and promising are golden currant, hawthorn snowberry, bitterbrush, and Rocky Mountain juniper.

Garrison creeping foxtail, a wetland plant, provides protection to pond margins and streambanks, yet is low-growing so that it does not interfere with fishing or swimming. A dwarf reed canarygrass is under development for this same use.

Sometimes, it is desirable to prevent use or foot traffic on critical areas. Memorial rose, a trailing

vine with an attractive flower, protects the soil surface and effectively discourages use.

Many plants developed for forage, erosion control, windbreak, or wildlife uses are also attractive in form, foliage, flower, or fruit. Crownvetch, whether used for roadbanks or forage, adds variety and beauty to the landscape; beachgrass plantings make the dunes photogenic; clumps of shrubs provide form and color throughout the season as well as a haven for wildlife.

Conservation plants provide variety to the landscape and beauty to the countryside. Alternating strips of green between the gold or cereal grain, grassed waterways tracing a pattern through the fields, lush pastures filled with grazing herds, and farm ponds surrounded by turf and shrubs are the landmarks of the conservation pattern. ♦

Pale ladythumb is being grown in plots at Gray Lodge, Calif., to test its value for waterfowl food (Photo courtesy California Department of Fish and Game).



Recreation Makes New Jobs

Operating fun farms gives young people new hope for future in the country

THE trend toward income-producing outdoor recreation on farms is having two beneficial side effects. These enterprises are keeping young people on the farm, and they are creating jobs for recreational and other skilled and semi-skilled workers.

Success stories

Since passage of the Food and Agriculture Act of 1962, the USDA has been able to expand its help to farm families who wish to establish rural recreational

businesses. There are many success stories.

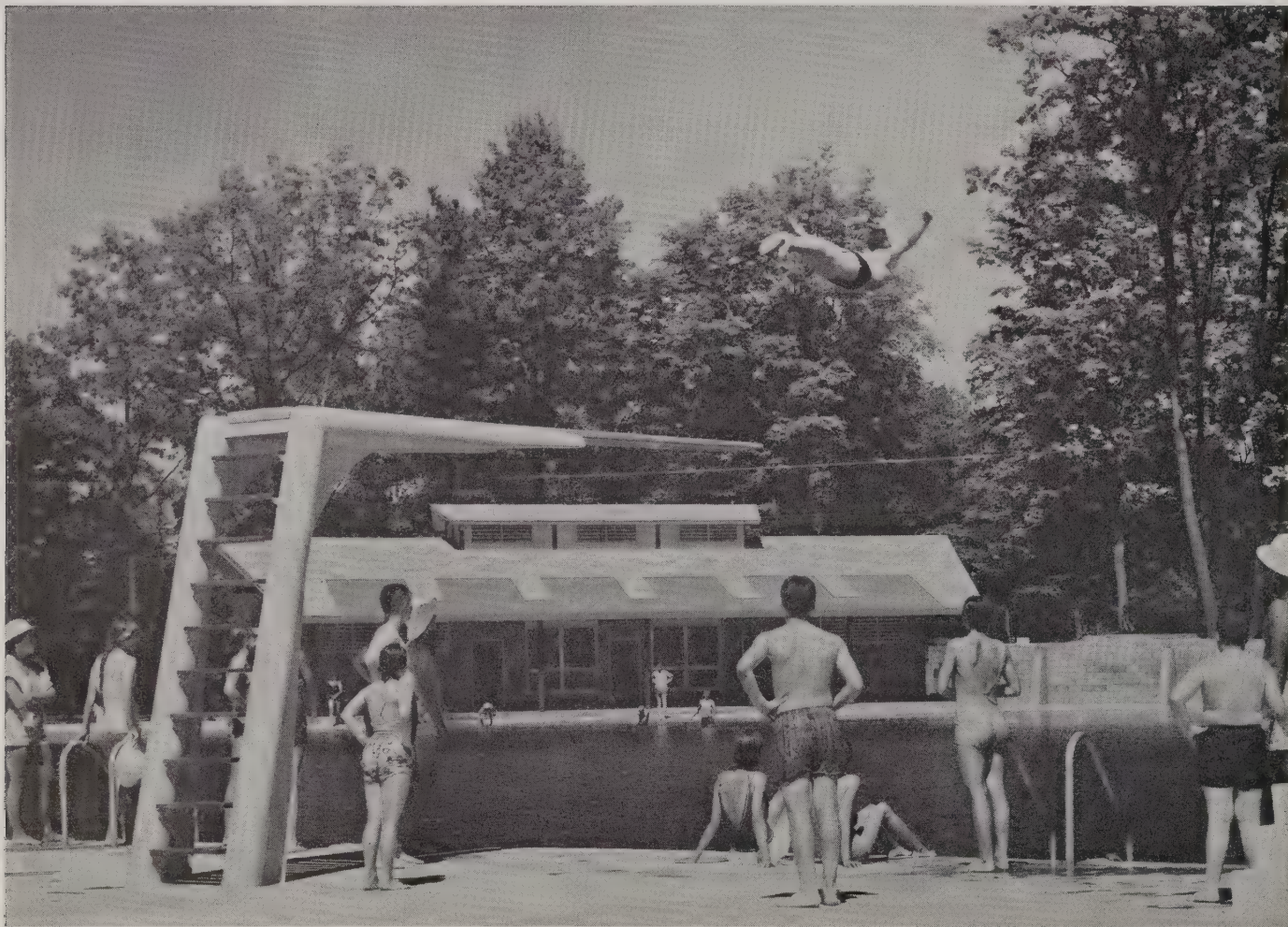
Take, for example, Mr. and Mrs. Frank S. Judd of near Litchfield, Conn., who converted part of their farm into a day camp for boys and girls 4 to 12 years old. In their first year of operation they employed a cook and six trained counselors, in addition to their three children, all college graduates with teaching experience.

They plan to increase the number of counselors as the enrollment grows, having 1 counselor for

every 10 youngsters. The counselors need to be experienced in handling boys and girls 4 to 12 years old. Their job is to teach and supervise such activities as swimming, boating, water safety, playground sports, woodcraft, nature lore, the handling of farm and other domestic animals, and conservation of natural resources.

At Slingerlands, N.Y., William R. Wais turned part of his apple and pear orchard, including a 5-acre farm pond, into a day camp and swim club. He employs a program director, a nurse, and specialists for waterfront, physical education, and arts and crafts activities. A pavilion and snack bar provide employment for four persons. Mrs. Wais and their daughter, Linda, help manage the enterprise.

High dive into the 4½-acre lake on the William Wais family recreation farm is executed by Tall Timbers Day Camp guest Ben Olds.



Frank Miscoski converted 150 acres of his 208-acre corn and wheat farm at Cream Ridge, N.J., into an 18-hole golf course. In addition to help from Mrs. Miscoski and their three children, he employs as many as nine workers.

Children help

Near Bangor, Maine, Calvin Johnson gave up dairy farming and went into the business of boarding horses. With others he formed the Ski Horse Mountain Association. The three Johnson children help run the activities. Several others, including a ski pro, caterer, waitresses, and ski lift operators, are employed full or part-time.

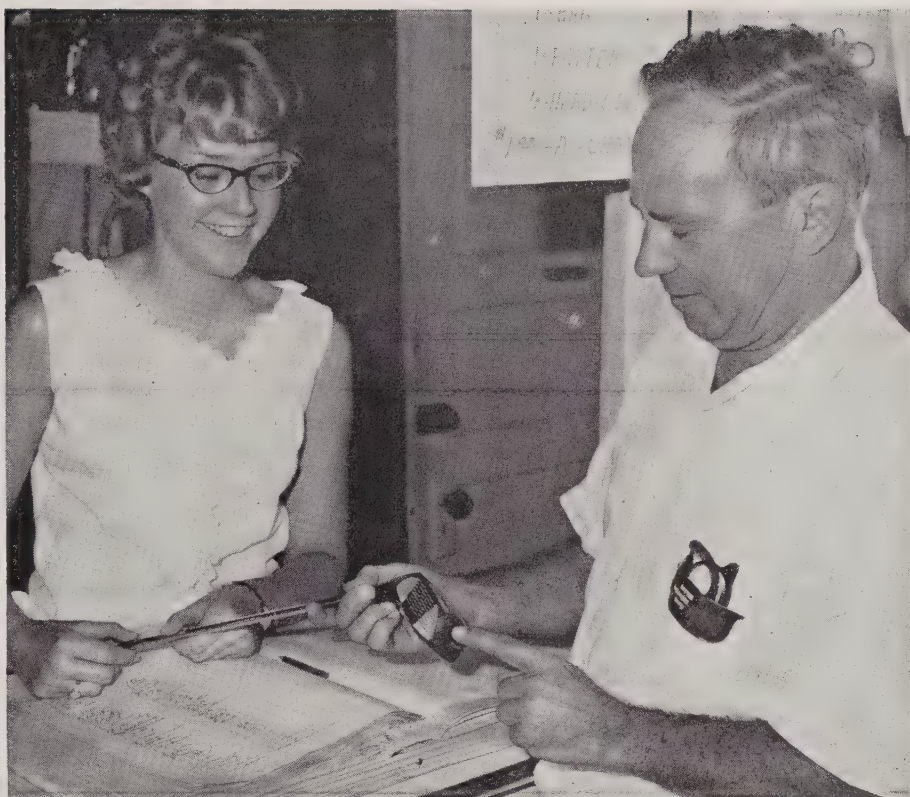
William D. Bailey just couldn't make a living from his 135-acre dairy farm at Pughtown, W. Va. Then he built a golf course. The enterprise was so successful the first year that William, Jr., and his wife, who had left the farm, moved back. In addition to their help, the Baileys employ a neighbor full-time in the summer, part-time the rest of the year.

Burton N. Packard, Jr., is the third generation of his family to own and operate a camp on Sebec Lake, Maine. The Packard's four children, who range in age from 13 to 20 years, plan to carry on the family tradition in their expanded operations.

Back to nature

"There's a trend back to nature today," Packard says. "But once most people get to a quiet, natural setting they like to have something to do. When Granddad Packard bought this place in 1893, the only outdoor recreation was fishing. Today we also have boating, water skiing, skin diving, swimming, hunting, hiking, camping, bird watching, picnicking, and nature study. To meet today's needs we have to have tent and trailer space as well as cabins and cottages."

All these new interests add up



Janice Miscoski, above, engages in sales talk at her parents' golf course clubhouse. Three generations help run the Packard family camp on Sebec Lake, Maine. Left to right below are Burton N. Packard, Jr., present owner and operator of the camp; his sons Burton N., Rickey, and Jerry, and Burton N. Packard, Sr.



to fresh opportunities for employment. As farmers move into the recreation business, there's a new need not only for the kind of trained and experienced employees usually associated with playgrounds and parks, but also for cooks, waitresses, shop managers, woodsmen, and persons who know how to operate ski lifts and other machinery. Packard, for example, has for the benefit of his guests a staff of guides experienced as woodsmen, fishermen, and outdoor cooks.

Conservation a help

Usually the conservation work already done by the farmer is useful in his recreation enterprise. Farm ponds are often the center of activity. Drainage systems make the land useful for recreation. Diversions protect play areas by channeling runoff water to safe outlets. Woodland management encourages wildlife, always a source of interest to the recreationist. Irrigation keeps golf courses green and attractive.

In developing recreation enterprises, farmers have the help of the Soil Conservation Service and other Department of Agriculture agencies, including the Farmers Home Administration, the Agricultural Stabilization and Conservation Service, and the Federal Extension Service.

SCS gives technical assistance through local soil and water conservation districts. FHA provides loans to low income farmers and to rural nonprofit associations. ASCS is authorized to cost-share in the conversion of cropland to recreation in a limited number of counties as a pilot program. The Extension Service provides training and consultation to managers and employees of outdoor recreation enterprises.

Conservationists point out that farmland converted to outdoor recreation can usually be reconverted to crop production should the need arise. Meantime Ameri-

can farmers are meeting a pressing need by turning part of their land over to recreational use. In doing so, they are creating new job opportunities for professional, skilled, and semiskilled workers. They are also providing opportunities for their children to remain as productive members of the rural community. ♦

Camporee Joins Scouts, 4-H'ers

BOY Scouts and 4-H Clubs in Bennington, Vt., have joined forces in Conservation Camporees. The highly successful innovation has resulted in more professional talent, a lively exchange of ideas, and a bigger bale of fun for everyone.

How did the conservation camporee idea get started?

First important factor was the site provided by the Vermont Forest and Farmland Foundation. The 2,500-acre mountain location near Rupert, Vt., offered a camping spread beyond compare.

The second factor grew out of the thought of integrating 4-H boys into Scout patrols. The boys with their leaders bring their own food and cook it themselves. The 4-H boys join Scout patrols and learn to do the things Scouts are trained to do.

Camporee directors are Bennington County 4-H Club Agent James "Bud" Edgerton; Boy Scout Executive Raymond C. Lovely, Taconic District, Green Mountain Council; Louis Dondero, soil scientist, and James L. Woodward, soil conservation technician, SCS.

The main topic the first year, 1963, was "soil and water conservation."

A plan was worked out by which more than 200 boys rotated between 20 instructors, 10 different topics, and in 4 hours all had covered the whole course.

Vermont State Fish and Game

experts gave a demonstration of fish management and stream control.

A forestry specialist from the State Department of Forests and Parks and private forest management groups gave classes on experimental plots to explain good forest management, tree planting, tree pruning, and the like.

Soil Conservation Service personnel gave instruction in general soil conservation, soil science, and the development of springs and seeps for water.

A fire warden supervisor gave an impressive demonstration on fire prevention and control.

The Bennington County Soil and Water Conservation District bulldozer was at work building a small wildlife pond about 300 feet from the camping area.

It was on this site that a class was held for the entire group of 205 boys and their leaders right after the noon meal. The talk was on ponds and pond construction.

The afternoon program was similar. Topics were of scouting skills to give the 4-H boys an idea of what scouting is like.

A second Conservation Camporee was held in September 1964. The topic was forestry. The afternoon program included demonstrations on survival, wildlife, soil and water conservation, and cooking without utensils.

Planning is well under way for the third Conservation Camporee. The theme will be "wildlife conservation." Subjects for instruction will include river pollution, fish management, deer herd and other game control, wildlife area development, gun and hunting safety, and others.

Everyone involved in the Camporee, from the staff to the newest Scout or 4-H boy, feels a great deal of pride as a result of his part in the conservation education of youth. — JAMES L. WOODARD, *Soil Conservation Technician, SCS, Bennington, Vt.* ♦

PLANTING utility rights-of-way to dense, low-growing vegetation is showing promise as a cure for maintenance problems in North Carolina.

Fescue, sericea, and shrub lespedeza are proving effective in four ways: They prevent erosion, keep out invading vegetation by shading and root competition, furnish food and cover for wildlife, and do not grow high enough to interfere with transmission lines.

Maintenance of utility rights-of-way through woodland areas is an expensive and recurring operation. These areas must be well kept so that trees will not grow into the powerlines and so that inspections and repairs can be made quickly and easily.

Various methods have been employed to control unwanted vegetation—hand cutting, disking and mowing, chemical sprays, and bulldozing. Such treatments are expensive and give varying lengths of maintenance-free periods.

Bulldozing given up

Recent studies by one North Carolina utility corporation indicated that bulldozing was the most economical method of maintenance. Since the study, however, this company has discontinued bulldozing and is now mowing rights-of-way with a rotary mower (brush-hog). The effects of bulldozing on the land were anything but desirable.

Bulldozing removed much of the topsoil from the rights-of-way and pushed it to the sides. The denuded area eroded rapidly. After a year or so, some areas were eroded down to the subsoil, and sometimes the parent material or even the bedrock was exposed.

The soil washed from the slopes and ridgetops was carried downhill and deposited in the intervening bottoms. Watercourses passing through such rights-of-way picked up heavy silt loads that resulted in filling stream channels and riverbeds.

Many of the deposits on bottom

Plants for Rights-Of-Way

Utility firms plant rather than bulldoze, get lower upkeep costs and better results

By E. R. Smith

Biologist, SCS, Raleigh, N.C.

land were 24 to 48 inches deep, indicating the large amount of soil removed from the slopes.

On such eroded land, the problem of unwanted vegetation is solved for a while, for natural revegetation under these conditions is very slow. It often takes 4 to 5 years for new cover to arrest erosion. Some areas continue to erode indefinitely because they are so sterile that vegetation can not survive.

The vegetation that volunteers after bulldozing is a mixture of herbs, grasses, tree seedlings and sprouts, shrubs and vines. Many of these plants produce food and

cover for wildlife — doves, deer, quail, rabbits, songbirds, and turkeys. They improve in value until about the eighth year, then they start to decline.

If natural vegetation could be left in this condition, everything would be fine, but between the sixth and eighth year the right-of-way has to be recleared, and the area starts its slow process of revegetation again.

Trees invade

Another fault of bulldozing is that it defeats its purpose by creating a favorable seedbed for new trees. Pine, yellow poplar, and

Conservation district, county, and utility company officials inspect a wildlife food planting along an electric power transmission line near Apex, N.C.



sweetgum — three of the fastest growing trees in the Southeast—all require mineral soil for seed germination. Bulldozing provides such a seedbed. Even if there are no seed trees nearby, the light, winged seeds are carried long distances by the wind.

The search for a more satisfactory maintenance method led to cooperative experiments with plantings of special vegetation in 16 North Carolina counties. Soil and water conservation districts, local utility companies, the State Wildlife Resources Commission, and the Soil Conservation Service have

joined hands in this venture.

Division of duties varies, but usually the utility company clears the rights-of-way and prepares the seedbed. The districts or other local groups furnish the fertilizer and some of the seed and do the planting. The Wildlife Resources Commission furnishes the rest of the seed. The SCS furnishes technical assistance.

The pattern generally followed is to plant the center of the right-of-way to fescue, with sericea or shrub lespedeza on the sides. This leaves the center open to travel for maintenance and inspection, while

the shade-tolerant lespedezas make a dense growth along the edges of the woodland.

Cooperative plantings

Such a cooperative planting was carried out in Wake County last year. The Carolina Power and Light Company, Neuse River Soil and Water Conservation District, and Wildlife Resources Commission planted a mile of powerline transmission right-of-way near Apex.

Roy Womble, chairman of the Wake County district supervisors, did the planting. An ardent quail hunter, Mr. Womble planted the edges to a special mixture of wildlife food and cover plants furnished by the Wildlife Resources Commission. The mixture contains shrub lespedeza as a base. The other plants—wild reseeding soybean, partridgepea, common lespedeza, and browntop millet—furnish food while the shrub lespedeza is maturing. These fade out as the shrub lespedeza matures and takes over the site. The middle of the right-of-way was planted to tall fescue.

All three of the participating groups have been well pleased with the results. Carolina Power and Light Company and the Wildlife Resources Commission have offered assistance in planting similar rights-of-way throughout the State. The Neuse River district supervisors invited leaders from other counties to visit the Apex planting. They were impressed with what they saw and returned to their counties with the intent of establishing similar projects.

As this type of maintenance becomes widespread, it not only will control erosion and benefit wildlife, but also will help to make North Carolina a more beautiful State in which to live and travel. ♦

Most of the land now used for cropland can be safely cultivated if protected by adequate conservation practices. ♦

Erosion slices a denuded slope after a powerline right-of-way has been cleared by bulldozing.



Conservation Districts Sponsor Neighborhood Youth Corps Project

A PROGRAM to enroll up to 300 young Nebraskans in soil and water conservation jobs is now under way as a Neighborhood Youth Corps project, under terms of Title 1-b of the Economic Opportunity Act.

It will give eligible young people a chance to: (1) Earn their own money, (2) complete their formal education, (3) gain valuable work experience, and (4) play an important part in building a better community through resource conservation and development.

Joint sponsorship

Nebraska's Soil and Water Conservation Commission is sponsoring the project with cooperation from the State's 86 local soil and water conservation districts, the Soil Conservation Service, the University of Nebraska Extension Division, the State Employment Service, other agencies, and schools.

The initial contract period is 6 months. However, the sponsor hopes the contract can be extended so that enrollees can be given up to 2 years of employment in all phases of resource conservation. The cost for the current 6 months is about \$350,000, of which \$287,700 is assumed by the Federal Government.

According to Warren D. Fairchild, executive secretary of the Soil and Water Conservation Commission, final selection of the young men and women is up to the supervisors of soil and water conservation districts. School officials and the local employment service screen the applicants. Criteria for acceptance include proof that the youths have come from "economically disadvantaged backgrounds." They must need money either to continue their edu-

cation or for training to prepare themselves for future employment.

"We're especially interested that their employment with the Youth Corps will be a stepping stone to something better," said Fairchild, "and efforts will be made through employment agencies to get them regular jobs after 'graduation' or to help them enough for further education."

Applicants are chosen without regard to color, race, or creed and come primarily from counties in which they are employed.

Enrollees are working at a variety of jobs, all of which further the aims of the local district's going program. Fairchild says there is no danger of replacing previously employed individuals, however, for "no district has yet had the funds to employ all the help that is needed."

Some of the jobs being carried out with Youth Corps help are tree planting, helping with conservation engineering surveys, staking terraces and dams, typing, maintaining files, inking conservation maps, preparing conservation displays, helping with field days and demonstration, seeding grasses, and managing and maintaining district equipment.

Opportunity for rural youth

Enrollees in the Nebraska program are mainly from farms, ranches, and small towns, and average 18 years of age. About one-seventh are young women. All enrollees are paid \$1.25 an hour.

In local conservation districts, primary responsibility for on-the-job counseling and supervision is through Soil Conservation Service personnel and district supervisors. Counseling is also provided by the Nebraska Soil and Water Conservation Commission. ♦

4-H Conservation Workshop Held

COOPERATION is the key word in Colorado's 1 week 4-H conservation workshop conducted annually during July by conservation agencies and organizations.

The workshop is held at a campsite on the Manitou experimental area of the Rocky Mountains Forest and Range Experiment Station near Colorado Springs.

The Soil Conservation Service gives direct leadership and technical assistance to the soil and water and range management sections of the workshop. Colorado State Forest Service; U. S. Forest Service; Colorado Department of Game, Fish and Parks; and Colorado State University Extension Service also play an important role in the program.

Instructors accompany the boys to the field each morning and give on-the-ground instruction. At the day's end boys give demonstrations and exchange information.

Ralph Kotich, Colorado State University extension conservationist, is training program director and coordinates the work program with the various related agencies and organizations.

Fred Mark, State conservationist, SCS, participates in the program along with the SCS personnel who work in the field with the boys.

Outstanding speakers in conservation are brought in, and leading farmers and ranchers attend to pass along their ideas on practical conservation. There is planned recreation to balance the program.

Most of the boys gain workshop sponsorship through their local soil conservation districts. The response to the program has been excellent.—RALPH KOTICH, *Extension Conservationist, Cooperative Extension Service, Fort Collins, Colo.* ♦

Speed-up in soil mapping . . .

Use of Stereoscope in the Field Improves Accuracy of Surveys

By Joel Cawthorn

Soil Scientist, SCS, Raleigh, N. C.

EXPERIENCED soil scientists agree that a stereoscope is needed during the soil mapping process. Some say that production can be increased as much as 10 percent and accuracy as much as 25 percent. Others say that it is difficult to handle two or more aerial photographs and a stereoscope in the field.

North Carolina soil scientists have found an answer to the problem. They list the advantages of field use of stereoscopes:

(1) After the soil scientist has marked on his map several places where there is a significant slope break, a stereoscope will enable him to complete the delineation with a high degree of accuracy.

(2) He can delineate landforms, such as bottom lands and stream terraces. If the boundaries can't be located in the office, a stereoscope can help the mapper trace them accurately after he finds them in the field. He can determine if local alluvial and colluvial areas are large enough to be shown on the map and can sketch their boundaries.

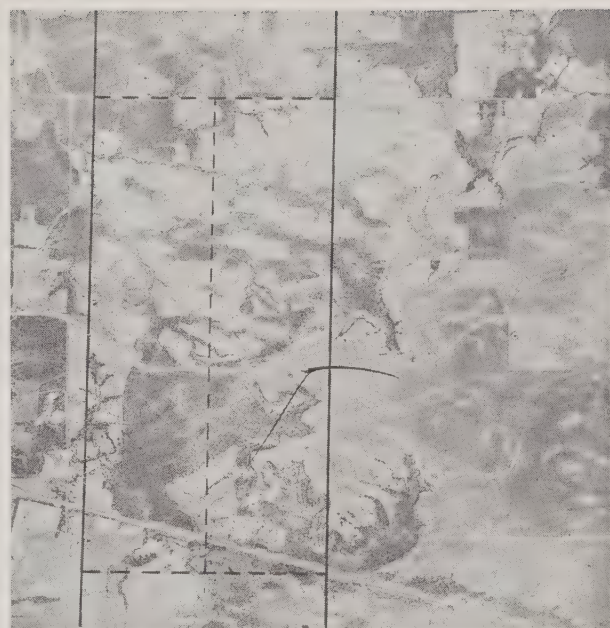
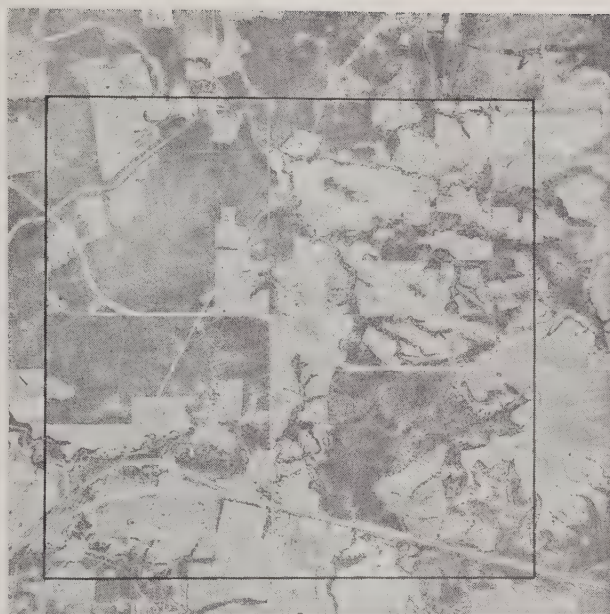
(3) Field use of a stereoscope helps the soil scientist to maintain an aerial view in depth of the area where he is working. It helps him to find a route to travel. He can study the lay of the land, locate gullies or other obstacles hidden from ground observation, and find trails, roads, and streams.

For many years soil scientists throughout the Soil Conservation Service have used aerial photographs with and without taking advantages of the third dimension and the greater photo detail available to those using a stereoscope. In North Carolina soil scientists are using the stereoscope to a greater

degree than ever before because they have found an easier way to use that principle. They credit this increased use of stereoscopes in the field to E. F. Goldston, a soil scientist with the North Carolina Experiment Station. In 1955, Goldston introduced a method of trimming, folding, and mounting alternate photographs on the mapping photograph to form an easy-to-use stereogram.

The pictures show how it is done.





Steps in Preparing Photographs

(1) *Mark match lines on the photographs to be mapped in the usual manner. The center photograph (top) is the mapping photograph.*

(2) *Select adjacent alternate photographs (top l. and r.)*

(3) *Sketch on each alternate photograph exactly half of the area of the mapping photograph.*

(4) *Trim the alternate photographs on upper and lower lines with sharp instrument. Sides may be trimmed, but leave at least 1 inch outside of the marked area. Mapping photograph is not to be cut or trimmed.*

(5) *Draw dashed pencil line across center of each portion of alternate photographs.*

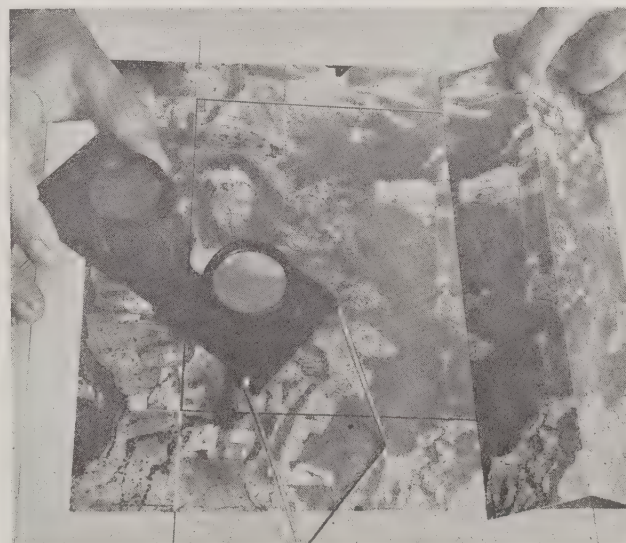
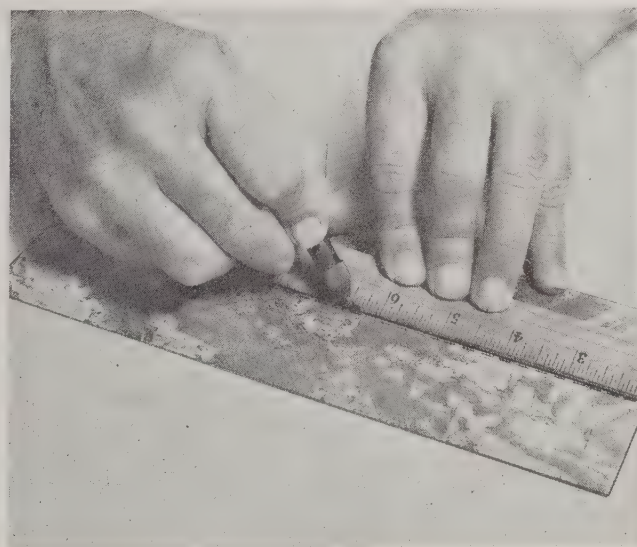
(6) *Cut through emulsion only along the dashed line with a sharp instrument.*

(7) *Fold so that mapping area of print shows and place in position for stereoscopic viewing (bottom r.)*

(8) *Fasten with tape outside the viewing area on alternate parts and beneath mapping photograph (bottom l.).*

(9) *Fold under for viewing near edge of mapping photograph and out for viewing center portions.*

(10) *Mark identification on remaining parts of alternate photographs and save for use with other maps.*



Grass and Livestock Keep Conservationist Busy

COASTAL bermudagrass is taking the 81-acre farm of Herman and Iona Crawford in the Harrison County Soil Conservation District, Tex.—just as fast as Crawford can spread it.

But he has a problem. His neighbors keep him busy planting the grass on their farms. Even with a new bermudagrass sprigging machine he has barely been able to keep up with the demand and to plant 40 acres for himself.

That part of his story started when he planted a field in 1962. The results were excellent, and in 1964 he harvested roots from this field and custom-planted 89 acres on other farms.

But Crawford's story really began in 1938 when he signed a lease-purchase plan with the Farmers Home Administration. He bought the farm in 1942.

Cotton and truck crops—the latter he sold from a stand built in his front yard—helped him to raise a family of seven children. He also worked at a chemical plant near his home. The whole family worked together, and in 1954 replaced the old house with a modern frame home.

But it didn't all come about just because he worked hard, Crawford will tell you. Eighty-one depleted acres just won't produce enough for a family of 9 without a lot of help. He got that help in 1946 when he became the 319th cooperator with the Harrison County District. With the help of the Soil Conservation Service he carefully worked out a conservation plan and followed it just as carefully. Vetch, in rotation with cash crops, worked wonders.

By 1960, he began to see that grassland and livestock would fit into his farming operations. In 1961, SCS helped him revise his district plan to change the course of his operations.



SCS Work Unit Conservationist Louis N. Neumeyer (l.) and Herman Crawford review the conservation plan that guided conversion of most of Crawford's cropland to grass. Crawford (below) raises livestock to match the quality of his coastal bermudagrass and crimson clover pastures.



He got another FHA loan to buy some cattle, including an outstanding Hereford bull. As the herd grew, his cropland acreage diminished. Now, his conversion

from rowcrop farming to livestock—and coastal bermudagrass—is all but complete. —LOUIS N. NEUMEYER, Work Unit Conservationist, SCS, Marshall, Tex. ♦

District Directors Set Example By Plow Planting on Own Farms

By Edward B. Trovillion

Work Unit Conservationist, SCS, Metropolis, Ill.

MASSAC County Soil Conservation District Directors Robert Travis and Wayne Hunerkoch are practical salesmen. They sell plow-planting by using it on their own farms.

And through the Illinois district's information program, they have influenced other farmers to begin using plow-planting and other minimum tillage practices.

With a degree in agronomy from

the University of Illinois, Wayne Hunerkoch joined his father in his 26-year-old seed corn business in 1958. Together they have put into use the latest methods in farming.

"We have been using plow-planting for 4 years," Mr. Hunerkoch says, "but it didn't receive much notice until it was given publicity in our newspaper."

District Board Chairman Bob Travis operates an 880-acre live-

stock and crop farm with his father and two brothers.

"We tried plow-planting on 30 acres the first year," he said. "It proved so good that we went 100 percent to wheel-track planting on 265 acres in 1963."

This year it was standard practice. Corn growers from miles around have come to look at their "rough corn planting" after they read about it in the paper. And when they went home, it was to try some of it themselves—or plan to do so next year.

Other directors of the conserva-

The Hunerkoch Seed Company farm is a practical demonstration of conservation farming. Besides the scenic contour strips of corn with alternate sweetclover plots, space is used for a recreation lake, a farm pond, and protected wildlife areas.



tion district are strong advocates of minimum tillage too, but don't have as much cornland. Earl Marlman had a zero-tillage demonstration last year. Phil Arensman used plow-planting this year and had a public demonstration of a new once-over implement which does the whole job of plowing and planting in one operation.

Wayne Hunerkoch, on his upland soils, has to use contour strips and alternates with sweetclover to prevent excessive erosion. The re-

sult on the Hunerkoch and Travis farms has been a great improvement in soil tilth and capacity for absorbing water.

Massac County farmers by the dozens are swinging to minimum tillage methods. The district directors who have been willing to have the public watch them succeed or fail deserve the credit.

The real test of a salesman is, "Does he use the product himself?" These men do, as a matter of choice. ♦



Massac County District Board Chairman Bob Travis plants corn in the rough 1 day after dense pasture sod was plowed down. A cross section of the soil in the Travis cornfield (below) shows the well-compacted root zone beneath the row after wheel-track planting.



Wayne Hunerkoch holds sample of granular Hosmer silt loam from his cornfield. He says plow planting has improved the condition of the soil from year to year.

Grass, Pipelines Restore Range

RANCHER George Wilson now grazes more than 100 head of whitefaced cattle on highly productive rangeland in the rugged mountain country of central Washington.

Native and introduced grasses and 17,000 feet of pipelines solved the problems of poor range and water shortage which had forced Wilson to dispose of his cattle herd in 1956.

The return to profitable ranching began in 1957 when Wilson became a cooperator in the South Central Okanogan Soil and Water Conservation District. In 1958, with the help of the Soil Conservation Service and the district, Wilson and his son, Mac, brought conservation planning to the steep sagebrush covered slopes high above the Columbia River.

SCS conservationists completed soil and other resource surveys and

helped develop a comprehensive conservation plan. The plan provided for grass seedings for spring grazing and summer and late summer forage, and installation of pipelines for livestock water. The 3,120-acre ranch is located in an 8- to 10-inch rainfall area.

For planting on old grain fields, the conservationists selected crested wheatgrass, an excellent early grass adapted to droughty, shallow soils. They chose intermediate wheatgrass for better sites.

Wilson used a homemade roller to firmly pack the fine sandy loam soils after seeding. He made the roller with a piece of 14-inch well casing plugged at the ends; on this he mounted 29 old car tires. He attached the casing to a metal frame and filled it with water to obtain the necessary weight.

The pastures were left undisturbed in the early stages of grass establishment, and the vigor of the native range was renewed.

By 1963, Wilson had about 400 acres of crested wheatgrass, intermediate wheatgrass, and native range divided into six areas. Most remaining former fields were seeded to adapted grass varieties this year. —ALBERT E. BLONDAHL, *Work Unit Conservationist, SCS, Okanogan, Wash.* ♦

Great Plains Council Holds Annual Meeting

The program of the annual meeting of the Great Plains Agricultural Council, held in Laramie, Wyo., July 28 and 29, 1965, encompassed topics relating to the effective use of water, river basin activities, and the family farm.

This council has pioneered in developing, promoting, adapting, and using programs to get better land use and conservation in the Plains. Dr. Glenn C. Holm, State Experiment Station, Stillwater, Okla., is chairman of the council. ♦



Conservation campers see weed-control experiment in field of corn grown on the contour. (Photo courtesy Massachusetts Division of Fisheries and Game.)

Conservation Camp Gives Boys New Viewpoint on Wildlife

By **Chester T. Kulisa**

Conservation Technician, SCS, Oxford, Mass.

EACH year the 150 boys attending the Massachusetts Junior Conservation Camp gain a new point of view on wildlife.

As one youngster put it, "I now have a better understanding of how good conservation farming goes hand in hand with more and better wildlife."

Another said, "I have an entirely different attitude toward wildlife, now that I've actually seen many of the animals out on the land and learned about their usefulness."

All areas of the State of Massachusetts are represented at the 4-H Camp Center in Spencer. The boys, 14 to 17 years old, are delighted to see deer, raccoon, owls, possum, and muskrats as part of their studies conducted by State and Federal professional conservationists. The conservation camp is directed by the Massachusetts Division of Fisheries and Game, Massachusetts Department of Natural Resources, and Massachusetts Conservation, Inc.

Part of each 2 weeks' camp

schedule in 1964 included classroom and outdoor laboratories on soil and water conservation practices and a field trip to observe conservation practices being established on local farms within the Upper Quaboag River watershed.

Typical of field trips was the one to the dairy farm of Dwight Proctor, Spencer. Mr. Proctor was the recipient of the 1953 Conservation Trophy Award, sponsored by the Southern Worcester Conservation District of which he is a cooperator. On his farm the boys observed corn being grown across the slope of the hillsides, weed control, land clearing, and stone-walls being buried to make larger fields for more efficient use of land.

As the boys walked over the 250-acre farm, they saw cover crops of rye, oats, and excellent hay-pasture mixtures for 100 head of Ayrshire cattle.

Some of the permanent type conservation practices observed on the farm were grassed waterways, four livestock and wildlife ponds,

open field drains, and an area recently drained with tile. On this 3-hour tour they observed to their delight, eight ducks, two woodchucks, two weasels, rabbits, squirrels, chipmunks, hawks, and fish in the ponds. They learned that as conservation district cooperators, farmers receive technical help from the Soil Conservation Service.

Following the tour of the modern dairy barn, built of native lumber harvested from the farm, the boys saw the use of modern haymaking machinery. Mr. Proctor spoke to the boys on better farmer-hunter relationships. He told how his 49 years of conservation

farming had increased the wildlife on his farm.

Each year, the Massachusetts Sportsmen's Clubs sponsor most of the campers, but gardens clubs, churches, town conservation commissions, newspapers, and radio stations are also helping to finance deserving boys.

At final sessions of the camping program, all participants are tested to see how much they have learned. Results show that these campers have improved their knowledge of fish, wildlife, law enforcement, and have gained a deeper appreciation of their heritage in soil and water. ♦

As an instructor in the camp, Soil Conservation Technician Chester T. Kulisa shows the boys how topsoil differs from subsoil. (Photo courtesy Massachusetts Division of Fisheries and Game.)



City Gets Award As SCD Cooperator

EFFECTIVE conservation on city-owned land has brought recognition to the City of Newton, Kans. It recently was presented a conservation award by the Kansas Bankers Association.

The city has cooperated with the Harvey County Soil Conservation District since buying a 240-acre tract in 1955 for well sites to supply city water. Half of the land was sandy, erosion-prone cropland. The rest was overgrazed rangeland.

Under a conservation plan developed with the help of the Soil Conservation Service, the cropland was seeded to a native-grass mixture and the rangeland was improved through proper range use. The land now supports a vigorous growth of native grasses and is leased for controlled grazing. —ELBERT J. GREEN, *Work Unit Conservationist, SCS, Newton, Kans.* ♦

Conservation Society Has 20th Anniversary

"Conservation is Everyone's Responsibility" is the theme for the 20th anniversary meeting of professional conservationists from throughout North America at the 4-day conference of the Soil Conservation Society of America in Philadelphia, Pa., August 22-25.

Society President Minott Silliman, Jr., Madison, Wis., said that the theme was chosen to show that all citizens—rural and urban, landowner and land user, city worker, and farmer—have an important stake in the management of renewable natural resources.

The sessions also were designed to help individuals engaged full-time in natural resources work keep abreast of new scientific, technological, theoretical, and practical developments in resource conservation, said Selden Lee Tinsley, New Brunswick, N. J., Chairman of the Program Committee. ♦

Agriculture and the Landscape

By **Marion S. Monk, Jr.**

President, National Association of Soil and Water Conservation Districts, Batchelor, La.

THE restoration, the enhancement, and the maintenance of natural beauty as an integral element or characteristic of the rural landscape are desirable goals capable of accomplishment. In this presentation the farmstead will be regarded as part of the landscape.

There are a number of prevailing reasons why significantly large tracts of the rural landscape are either deteriorating in appearance or are failing to make a reasonable contribution to a countryside that ought to be notable for its natural beauty. It is useful to identify some of the chief causes of ugliness, monotony, and drabness as a prerequisite to recommending solutions.

Poverty vs. beauty

Beauty rarely exists in the midst of poverty. For the millions of rural people trying to get along with a marginal income or less, matters of beauty do not get a high priority. First claims on the funds and attention of low income families are the size of the next crop, payment of taxes, payments on the interest and principal of loans, clothing and education for the children, bread to eat, and a roof overhead. Low farm income is probably the number one enemy of natural beauty in rural America.

Investments in beauty are investments in the future. There is little incentive for farm families to invest in the appearance of farmsteads or farms when fore-

closure or sale is just around the corner. Thousands of farm families are leaving the farm each year and this instability operates against attention to beauty in the countryside.

Even where there is stability and a reasonable income, attention to the appearance of the farmstead and the landscape has suffered from apathy or misguided notions that investments in appearance are either superficial, vain, or improvident. In too many communities, a pleasing environment has not been given the status of an acceptable community or individual objective. In these circumstances, there is neither organization nor attitude to identify aspects of beauty and foster them.

Untended land

There is an increasing area of abandoned and little-used land in rural America as agricultural production efficiency operates to restrict the acreage devoted to crops and livestock, and as small farms are sold or retired from production. Increasing thousands of acres are growing up in weeds, brush, untended grass, and scrub trees. More often than not, these lands become an eyesore.

In addition to untended idle land, there is eroded land—land torn with gullies by excessive or misguided use, stripped of its productive topsoil, and laid bare by wind and water. Whether as forlorn remnants of former mistakes, or the angry evidence of damage now progressively under way, these marks of waste are, to say the very least, unsatisfying.

Neither beauty nor attention to it are automatic. Heretofore there has been little realistic incentive to bring action in this direction. As a government or community purpose, it has not often ranked high as a claimant for time, money, informational help, or technical assistance.

If these are, indeed, some of the key reasons for cancer spots of ugliness, drabness, and inattention to beauty in the rural landscape, then some of the avenues to improvement become evident.

We need . . .

We need to continue our exploration in the United States for ways to improve the income of disadvantaged rural landowners and operators.

We need to continue our concern for farm family stability.

We need a program purposefully focused on the use of land within its basic capabilities and the treatment of land according to its needs for protection and use. Eligible use, in this program, should not be confined to commodity production.

We need a program of technical assistance, cost-sharing, and perhaps loans to help convert abandoned, idle, or little-used farmland from the ugliness of weed and brush infestation to some constructive uses—whether these be for wildlife, nature trails, water development, or purely esthetic enjoyment.

We need to step up conservation and resource development work on the operating farms and ranches of the country—not only

This statement was presented to the panel on Agriculture and the Landscape at the White House Conference on Natural Beauty, May 24.

to heal the scars of past carelessness and exploitation, such as gullies, muddy streams, and eroded fields; but to create the fact as well as the appearance of orderly cooperation by men with Nature.

We need to establish the restoration and enhancement of natural beauty as an acceptable, important goal of the people of the country.

Government agency personnel working in the countryside must be authorized and directed to assist, through their regular program functions, toward attainment of the goal.

Local action

Progress will require the continuing support and participation of a variety of local organizations. Important among these are the 3,000 soil and water conservation districts organized under State laws in the 50 States, Puerto Rico, and the Virgin Islands. They are operated by local people and concern themselves with the conservation, development, and management of land, water, and related natural resources. These local subdivisions of State government cover more than 95 percent of all the privately owned lands of the Nation. It is through them that the Department of Agriculture provides technical and other assistance to more than 2 million land owners and operators and to thousands of communities.

Consideration should be given to a program designed to improve the appearance of farmlands and farmsteads—as well as the rights-of-way—adjoining the Nation's main-traveled highways. Cost-sharing and technical assistance would be important ingredients to progress on these properties.

Consideration should also be given to the development of potentially pleasing vistas of unique or particularly pleasing natural beauty, extending well beyond the highway rights-of-way and the immediately adjoining farmland.

Attention to these vistas, especially rolling lands that have gone out of production or are scheduled for retirement from cultivation, could be most rewarding.

Most important, probably, is recognition that land and water are basic elements in the restora-

tion and enhancement of natural beauty in the countryside. They are the source of the wealth that makes improvement of the farmstead possible. And they are, in themselves, the very substance of the rural landscape demanding attention. ♦

Recommendations of the Panel On Agriculture and the Landscape

THE panel on Agriculture and the Landscape of the White House Conference on Natural Beauty, May 24, submitted 10 specific recommendations to the President.

Chairman of the panel was Dr. Edward H. Graham, Vienna, Va., chairman of the Commission on Ecology of the International Union for the Conservation of Nature and Natural Resources and formerly assistant to the administrator, SCS.

Other members were D. A. Williams, administrator, SCS; Marion S. Monk, Jr., president of NACD, Batchelor, La.; Karl J. Belser, director of planning, Santa Clara County, Calif.; F. Fraser Darling, director of research, Conservation Foundation, New York; Andrew J. W. Scheffey, University of Massachusetts, Amherst, Mass.; Paul B. Sears, Yale University, New Haven, Conn.; Robert G. Wenkam, Hawaii State land-use commissioner, Honolulu.

The panel, acknowledging that three-fourths of America's nonurban land is in private hands, emphasized the need to use existing organizations and institutions rather than to devise new ones in maintaining and developing a beautiful countryside.

Against this background the panel recommended that:

“(1) Use of land capability classification and other resource inventories be made a condition for local and area planning, land use determinations, and zoning.

“(2) The President call on the

Governors of the 50 States to exercise leadership in total land use planning as a means toward the orderly development and enhancement of the landscape within the States.

“(3) Guidelines be formulated to assist States in developing appropriate legislation for zoning, tax structures, ordinances, easements, development rights, etc., that would protect open space and prime agricultural land; and that the President consider proposing to the Governors the enactment of such State legislation.

“(4) Consideration be given by the Federal and State governments to a system of grants or tax concessions which would help offset revenue loss by local governments on land retained in agricultural or open space use.

“(5) In all land retirement and cropland adjustment programs, preservation and enhancement of natural beauty be considered an associated purpose in the technical assistance and cost-sharing provided through long-term agreements or contracts.

“(6) Preservation and enhancement of natural beauty be made an associated purpose of Federal programs of resource development and management, including technical assistance, cost-sharing, grants and loans involving non-profit organizations, private landowners, communities, and local subdivisions of government.

“(7) Public resource programs be strengthened and local leadership be encouraged to initiate and

make more effective rural-urban planning and action through such mechanisms as soil and water conservation districts, small watershed projects, Resource Conservation and Development projects, planning boards, and other local organizations.

“(8) Professional training, research, and educational services in our college and university system to be expanded to deal with problems of the landscape and as a part of the total human environment; and that the President consider requesting these institutions to inaugurate appropriate programs within the several States.

“(9) Public land-administering agencies include natural beauty as a purpose associated with the management and treatment of all public land and water resources, with special attention to problems involving intermingled or contiguous private land.

“(10) Consideration be given to nationwide recognition of outstanding farm landscapes, comparable to that accorded historic and natural history sites.” ♦

Youth for Beauty Program Announced

“**W**HEN I look for new ideas, new approaches, I look for people who are young—or to people who think young.”

These remarks of Secretary of Agriculture Orville L. Freeman were part of his speech to launch a nationwide “Youth for Natural Beauty” campaign.

He named Luci Baines Johnson, the President’s daughter, honorary chairman of the program at a ceremony opening an exhibit on natural beauty in the patio of the Department of Agriculture building. The exhibit included the Soil Conservation Service’s “America the Beautiful” series of color photographs.



After naming Luci Baines Johnson honorary chairman of a “Youth for Natural Beauty” program at a ceremony in the patio of the Department of Agriculture Building, Secretary Freeman conducted the President’s daughter on an inspection of the Soil Conservation Service’s America the Beautiful exhibit of color photographs.

The Secretary challenged America’s young people to become a driving force in the war on blight, to regain and retain the beauty that is America before it slips through our fingers and is irrevocably lost.

Many of the country’s 21¼ million 4-H club members in USDA’s own youth program will take a leadership responsibility in the campaign. Other leading young people’s organizations will initiate their own beautification programs. Among them are Camp Fire Girls, Inc., Girl Scouts of the U.S.A., Boy Scouts of America, the Future Farmers and Future Homemakers of America, Junior Achievers, “JETS,” and others.

In order to give impetus to the program, the Sears-Roebuck Foundation will sponsor a program of awards to be made through the National 4-H Committee for community beautification activities.

The Readers Digest Foundation is making available also a Citizenship-in-Action grant through the National 4-H Club Foundation.

The money will be used by local 4-H clubs for various community service projects, including beautification.

The Boy Scouts of America have been helping to preserve and promote natural beauty since the scouting movement started. There are many recognitions in scouting for beautification and conservation. The Soil and Water Conservation merit badge is mandatory for the Eagle rank. Secretary of Agriculture Freeman makes annual conservation awards to Boy Scout councils with outstanding conservation records.

The Girl Scouts and Camp Fire Girls also have outstanding programs in natural beauty.

The local youth groups no doubt will turn to soil conservation districts for support in their conservation and beautification projects. Many districts have helped in the past by providing planting materials and other assistance for youth projects.—KARL F. MUNSON, *Program Leader in Recreation, Federal Extension Service, Washington, D. C.* ♦

Soil Workshop Helps Farmers Make Plans

SOIL and water management workshops are used by the Soil Conservation Service and Agriculture Extension Service in Wright County, Minn., to give farmers the knowledge and understanding of their soil and water resources needed to make their plans as soil conservation district cooperators.

Farm owners and operators, and at times persons such as bankers who work closely with farmers and representatives of other agricultural agencies, have been invited to participate.

Instruction is done by Orville J. Berry, SCS work unit conservationist, and Eugene Ellis, soil conservation agent, Agricultural Extension Service, University of Minnesota.

Participants receive an understanding of soils and land capabilities which helps them to make decisions in adjusting farm operations to meet changes in agriculture.

Berry and Ellis believe the workshop principle will help to further the knowledge of any group in such matters as watershed protection, resource conservation and development, cropland conversion, and other land use adjustment matters. ♦

Conservation District Publishes on Soils

TO INFORM land users about the value of available soils information, supervisors of the Strafford County Soil Conservation District, N.H., have published an attractive, easy-to-read brochure titled "We Need to Know More About Strafford County Soils."

Located in southeastern New Hampshire, Strafford County is undergoing rapid urban expansion with small industrial plants, housing developments, and recreation facilities occupying what was once forest and dairy farmland.

The brochure tells what the soil survey is, who can use the information, and suggests ways the survey and knowledge of it can be used.—SIDNEY A. L. PILGRIM AND E. MALCOLM STROM, *State Soil Scientist and Assistant State Conservationist, SCS, Durham, N.H.* ♦



New Publications

Warm Water Ponds for Fishing. BY W. W. NEELY, VERNE E. DAVISON, AND LAWRENCE V. COMPTON. 1965. *USDA Farmers' Bul.* 2210. 16 pp., illus. This well-illustrated bulletin points out the importance of site, erosion control, proper stocking, adequate fertility, and weed control. It explains how to manage a warm-water pond for profitable fishing. The bulletin, however, is specific only for "warm-water" ponds, not for "cool-water" or "cold-water" ponds. It supersedes Farmers Bulletin 2094, "Managing Farm Fishponds for Bass and Bluegills."

Wild Rivers. 1965. U. S. Dept. of Agr. and U. S. Dept. of Interior 42 pp., illus. This beautifully colored picture book, printed with private funds, illustrates the reasons for keeping at least a small stock of our rivers as we first knew them—wild and free-flowing—instead of dedicating all to our material welfare.

The book describes how the remaining wild ones provide the recreation and beauty America needs today.

A USDI and USDA special Wild River Study Team identified 73 rivers or river segments that appear to have wild characteristics.

Survival Or Surrender for Our Endangered Wildlife. 1965. U. S. Dept. Interior, Bur. of Sport Fisheries and Wildlife Circ. 223 16 pp., illus. A well-illustrated booklet describing the drastic changes in abundance of wildlife in North America.

The USDI specialists classify the status of wildlife species and subspecies or races as: *Endangered* species, whose prospects of survival and reproduction are in immediate jeopardy; *rare* species, whose numbers are few throughout its

range; *peripheral* species, whose occurrence in the United States is at the edge of its natural range; and *status questionable*. Thumbnail sketches are given of 15 principal species of concern.

The American Outdoors, Management for Beauty and Use. 1965. *USDA Misc. Pub.* 1000, 76 pp., illus. Concepts of beauty as applied to landscape and some methods of improving the appearance of field and farm, range and woodland.

Soil Surveys

The following soil surveys have been published by the Soil Conservation Service in 1965:

Saunders County, Nebraska. BY JOHN A. ELDER, T. E. BEESLEY, AND W. E. MCKINZIE. 1965. 81 pp., illus.; maps 3.17 inches to the mile (1:20,000).

Armstrong County, Texas. BY LOUIS L. JACQUOT, LUTHER C. GEIGER, BILLY R. CHANCE, VERLE D. WOODS, DONALD A. LEATH, AND LYNDON C. IMKE. 1965. 80 pp., illus.; maps 3.17 inches (1:20,000).

Elliot County, Kentucky. BY BILLY C. WEISENBERGER, H. P. McDONALD, AND H. A. WALLACE. 1965. 55 pp.; illus., maps 4 inches (1:15,840).

Monroe County, West Virginia. BY JOHN L. GORMAN AND LEONARD S. NEWMAN. 1965. 114 pp., illus.; maps 3.17 inches (1:20,000).

Meriwether County, Georgia. BY R. D. WELLS. 1965. 85 pp., illus.; maps 4 inches (1:15,840).

Crow Wing County, Minnesota. BY H. F. ARNEMAN, LOWELL D. HANSON, H. P. HERMANSON, AND DAVID HILDE. 1965. 40 pp., illus.; maps 2 inches. (1:31,680) and 3.17 inches (1:20,000).

Wayne County, Georgia. BY D. GRAY AYDELOTT, HERSCHEL L. PAULK, AND DANIEL D. BACON. 1965. 74 pp., illus., maps 3.17 inches (1:20,000).

Suwanee County, Florida. BY T. B. HOUSTON, M. W. HAZEN, JR., T. C. MATHEWS, AND G. A. BROWN. 1965. 101 pp., illus.; maps 3.17 inches (1:20,000).

Reconnaissance Soil Survey of Fourteen Counties in Eastern Kentucky. BY HERMAN P. McDONALD AND ROBERT L. BLEVINS. 1965. 72 pp., illus.; maps 1 inch (1:63,360). Includes Bell, Breathitt, Clay, Floyd, Harlan, Johnson, Knott, Lawrence, Leslie, Letcher, Magoffin, Martin, Perry, and Pike counties.

From the Administrator:

The Enhancement of Natural Beauty



PRESIDENT Johnson, with strong supporting interest and assistance from the First Lady and their charming daughters, has focused the attention of Congress and the Nation on the needs and values of enhancement of natural beauty throughout the land.

He has assigned to Secretary Freeman the responsibility for Federal leadership for the beautification on privately owned rural lands of the countryside. That is a big order since nearly three-fourths of our land area is in farms, ranches, and other private holdings.

To carry out his assignment, the Secretary has issued a policy memorandum to guide the Department and each of its agencies in program development and action needed to make a major contribution to achieving a more beautiful America. In that policy guide the SCS is given a very substantial role which is being detailed in formal instructions within the Service.

In a very great measure the soil and water conservation work done by land owners and operators throughout the country with SCS assistance affects the rural landscape. Natural beauty is a normal product of effective soil and water conservation practices and sound resource use. The need for such a campaign as the President has initiated arises from the fact that in thousands of communities too many areas and too many watersheds are still marred by the scars of erosion and other unsightly results of misuse, overuse, and even abandonment.

Not all people who enjoy the esthetic benefits of soil and water conservation understand and

appreciate what is being done. One of our big jobs is to inform our citizenship of these facts and to further enlighten them about what can be done for the good of the land and all the people.

And we in SCS must do more. Among ourselves in our day-to-day tasks we must be conscious of the values of natural beauty and build it into all our soil and water conservation work.

In providing technical assistance to individual land owners and operators we expect SCS conservationists and technicians to give full consideration to:

(1) Ways in which planning of land use and soil and water conservation measures can improve the beauty of the countryside, especially areas visible from roads and highways

(2) Greater use of conservation practices having natural beauty and landscaping values, especially on small odd areas, field borders, bogs, marshes, pond and stream margins, and wild areas

(3) The use of adaptable plant materials, including seedings, for conservation purposes which contribute to natural beauty wherever practicable

(4) Encouraging each soil conservation district cooperator to incorporate into his conservation plans provisions for roadside improvements, elimination of "eyesore" areas, and farm road beautification, including attention to the harmony of the farmstead with the natural setting.

In addition, all real properties under SCS control will have a plan for landscaping and maintaining the appearance of buildings. Insofar as we are able, we

will offer advice on landscape improvement, as appropriate, to owners and managers of properties where SCS is a tenant.

State conservationists will include in their monthly narrative reports citations of special actions and accomplishments in achieving improved natural beauty by soil conservation districts and others as a result of SCS efforts.

A good beginning point for work units would be to urge conservation district officials and other local leaders to select for early attention "show window" or "target" areas along travelways where improvements toward rural beauty will be appreciated by the most people. Conservation work on such areas should create interest and participation among local leaders in rural and urban areas alike and result in substantial community pride across the Nation.

As I had the privilege of telling the Agriculture and Landscape panel of the White House Conference on Natural Beauty, there is one ingredient without which these rural beautification goals cannot be achieved. That ingredient is *people*.

Soil and water conservation districts and the small watershed projects provide effective devices through which the several segments of a community can work together on common resource problems. The new Resource Conservation and Development projects, because they embrace even larger geographic areas, provide an especially effective means of teamwork on a wide range of resource activities contributing to the enhancement of natural beauty.

We will help and encourage the leadership of all of these local conservation agencies to give greater emphasis to natural beauty in their programs and to participate actively in comprehensive planning that will make rural-urban cooperation more effective.

—D. A. WILLIAMS



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Conservation Gives Plenty of Scouting Activity

BOY Scout Troop 29 and conservation are synonymous in the Grand Traverse Region of Michigan and especially in Leelanau County, its home port.

In the 15 years since it was chartered, this troop has set a pace in conservation work hard to match in the scouting realm.

One project in particular stands out in their long list of achievements. That was the loading and hauling of 100 tons of rock for the Solon Creek Watershed Project. The rock was used in riprapping streambanks to anchor the soil and stop erosion of adjacent farmlands; for building deflectors to eliminate sandbars and silt, and in installing "V" dams to raise water levels and improve fish habitat.

Take a look at what the boys did the past year! They hand-planted more than 7,000 pine trees; constructed 50 wood duck nesting boxes; built 152 martin houses, 4 litter barrels, 3,855 bird houses, feeders, and kits; showed conservation movies to 3,063 persons—all this in addition to their regular projects like the maintenance of a wildlife pond; maintenance of a cemetery; collection of canceled stamps for the YMCA; putting on



Troop 29 boys built 3,855 bird feeders, houses, and kits in their work shop last year.

"show and do" programs, periodically submitting construction plans of bird houses, feeders, etc., to the local newspapers; and assisting in making creel and game censuses for the Michigan Department of Conservation.

Keeping up with the supplies needed for these many diversified projects keeps Scoutmaster William Pritchard "humping," particularly since it's on a "no cost"

basis. Industries in the Grand Traverse area save for him all their scrap lumber, wire, used sandpaper, nails, and paint.

With a membership of 46 boys from a start of 10, the unit has a continuous service record of 15 consecutive years, 638 consecutive weeks, 713 consecutive days and nights, and 150,749 total hours.—CHARLES M. SMITH, *Biologist, SCS, East Lansing, Mich.*

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Soil Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES





Model . . .

The Nation's attention is focused on the Potomac River basin in the spotlight of the President's recent charge to Secretary of the Interior Udall to replan it as "a model of conservation."

As the Secretary's study groups and planning councils widen to include concerned land use agencies and State and local governments—as all successful resource conservation efforts must—we see a growing realization that the prized values of the main river depend on the care and protection given the upper tributaries and their watersheds.

Our center-spread feature (p. 35) tells the story of the action already under way there in conservation districts and watershed projects. It is fashioned by Writers Bernie Roth and Jim Miller from facts provided by our Watershed and River Basins staffs on what has been done and the much larger task remaining.

Sediment: The multiple damages of soil erosion, wherever it occurs, become more evident every day. The injury is not limited to the void left where the soil is removed; the space occupied where it comes to rest may be even more costly. Texas Field Engineers Vavra and Pearson (p. 33) explain an unfamiliar problem of sediment in irrigation systems and Geologist John Roehl tells (p. 39) how engineers must provide for sediment storage in watershed structures.

COVER: A kayak racer enjoys the rushing white water of the upper Potomac in one of the popular canoeists' events in West Virginia (photo courtesy West Virginia Department of Natural Resources.)

Soil Conservation

Devoted to the wise use of land and water resources

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Secretary of Agriculture

Assistant Secretary of Agriculture

Administrator, Soil Conservation Service

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Editorial Assistant

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Bahiagrass and pines provide a pleasing green backdrop as well as effective cover for a stretch of Georgia Highway 29.

The ladies' touch . . .

Highway Beauty In Georgia

By R. W. Oertel

*Assistant State Conservationist, SCS,
Athens, Ga.*

SUPERVISORS of Georgia's 27 soil and water conservation districts welcome the ladies' touch in a concerted drive to stabilize and beautify the State's roadsides.

The Georgia ladies are teaming up to lead the campaign—in women's clubs, garden clubs, federated groups, and soil and water conservation district auxiliaries.

Their goal is to turn the State's highways into corridors of beauty and to focus attention on the natural scenic attractions of the "Peach State."

Helping them do the job are many groups including the conservation districts, town and city councils, county commissioners, the State Highway Department, State and local park boards, planning boards, congressional representatives, watershed associations, PTA's, and others.

They're changing eye-sores into beauty spots of roses, flowering dogwoods, or blooming lilies along traffic arteries through metropolitan areas, small villages, and open expanses of countryside. They're sprucing up entrances into their towns, encouraging highway people to plant flowering shrubs in median strips, turning former ugly spots between highways and railroads into strips of fresh green grass and eye-catching flower beds, and dressing up roadside parks and "pull offs."

One of the most energetic and effective conservation leaders among Georgia women is Mrs. Glenn A. Dowling of Albany, State conservation chairman, Georgia Federation of Women's Clubs. In addition to effectively organizing the conservation activities of the Federation, she carries her per-

sonal message directly to local clubs. With a set of colored slides, she travels over the State encouraging women to greater conservation activity.

Erasing eye-sores

Mrs. Dowling has been concentrating on such roadside eye-sores as junk yards, dumping grounds, and litter. Pointing to an auto graveyard on a highway leading into one of the State's largest cities, she asked, "What kind of impression do you think travelers get as they pass this junky looking place? Spots like this detract from the natural landscape beauty. If yards like this are necessary, they can be screened off from the highway or else located in other places."

Mrs. Dowling has recently been selected for inclusion in the 1966

edition of Outstanding Young Women of America, largely in recognition of her conservation leadership.

Mrs. Maurice Cameron, McRae, State conservation chairman, Daughters of American Revolution, is another outspoken woman conservation leader trying to stabilize and beautify Georgia roadsides.

"In too many cases," Mrs. Cameron said, "the highway builders take great care to lay the concrete, asphalt, and gravel just right and then completely forget about the roadsides. There's no reason why they can't do the whole job while they're at it."

The problem of roadside erosion is particularly serious on many highways in Georgia. As much as 359 tons of soil wash off an acre of exposed roadside annually, according to recent studies by the Agricultural Research Service.

Erosion and siltation

Cecil W. Chapman, State conservationist, SCS, emphasizes that the effects of roadside erosion are widespread.

"Not only does this eroding soil leave ugly gully scars behind, but it causes trouble wherever it goes. It fills roadside ditches, clogs road culverts, and spills over into farm drainageways and destroys growing crops. Sometimes it covers city



Ugly scars of erosion still mar the view and are a threat to motorists on some Georgia highways.

streets and backyards.

"Much of the silt enters streams, destroying natural fish habitat and eventually is deposited in ponds, lakes, and reservoirs. Everyone suffers when soil washes off unprotected roadsides."

Soil and water conservation districts with the help of SCS have set up demonstration projects in many counties to show that a good vegetative cover will stop the destructive erosion. Once that is accomplished — and only then — should shrubs, trees, and flowers be planted to enhance the beauty of the roadsides.

The Atlanta Soil and Water Conservation District Supervisors and the Fulton County Commissioners are cooperating in carrying out an unusually effective roadside beautification and stabilization program.

"We're proud of what we're doing to beautify our roadsides," said Archie Lindsey of Alpharetta,

The Georgia ladies are concentrating on eliminating such unsightly scenes from the State's roadsides.



one of the commissioners. "We want to grass all the roadbanks in our county as soon as we can."

Lindsey said, "Before we started tying down our road banks, we were continually cleaning rocks and silt out of the road ditches. This costs a lot of tax money that could be used for better purposes."

Daylilies and cannas

In the South River watershed near Danielsville, the Comer Women's Club is working with the Broad River Soil and Water Conservation District in planting daylilies on many of the road banks. Mrs. Howard Strickland, chairman of the Daylily Committee, said:

"All our ladies are quite thrilled about this project. We are helping to make our roadsides more attractive, and, of course, these lilies will help to eliminate those awful gullies along our roads."

An excellent example of well-kept and attractive roadsides can be seen on Georgia Highway No. 79 north of Soperton. Seeded to bahiagrass and bounded by colorful native dogwoods and pines, this 10-mile stretch of highway has been an "eye-catcher" for motorists for more than 15 years.

Women in other sections of Georgia are also helping to beautify the roadsides. For instance, motorists traveling through Colbert during the summer see five large beds of cannas in bloom surrounded by neatly clipped grass borders. They grow in what once was an unattractive strip of land between a highway and railroad track.

The project that the ladies started in 1959 has developed into a real community project, and it's a money-maker, too. Each fall the ladies sell more than \$600 worth of tubers to visitors from many States who have admired the beautiful flowers as they traveled through Colbert.

In Columbus, the ladies' clubs spearheaded a drive to beautify the



Wives of the directors of the Middle Oconee River and Walnut Creek watershed associations hear U. S. Department of Agriculture specialists talk about roadside erosion control practices.

city and highways entering it. Now rose beds in median strips are a pleasing sight on several streets including Victory Drive leading toward Fort Benning. The city also planted decorative trees such as the Purple Thundercloud plum, flowering dogwood, and crepe myrtle.

Roadside parks

Georgia has some of the finest and prettiest roadside parks in the South. Ladies' clubs have cooperated with county and State highway officials in keeping these parks and pull-offs attractive. For example, the garden club at Alma sponsored and maintains an inviting roadside park which is heavily used.

Many homeowners, businesses, schools, hospitals, and others have taken the cue from these highway beautification efforts. For example, in Columbus, St. Francis Hospital has used pyracantha as an effective screen for its parking lot. Colum-

bus College under the leadership of Dr. Thomas Whitley cooperated with the Pine Mountain Soil and Water Conservation District to develop and apply a conservation plan. Now the rolling campus is not only protected from erosion but is a beauty spot as well.

The ladies of Tifton decided nearly 3 years ago to do something to help women take a greater interest in the conservation effort in Georgia. Members of nine women's and garden clubs in the city worked with representatives of Abraham Baldwin College, the local conservation district, and the SCS in planning and carrying out a conservation workshop for women. Seventy-five women attended the first year, and the number rose to 125 in 1964.

Mrs. Laura Hawkins, LaGrange, southeastern area vice president of the Ladies Auxiliary, NACD, and a long-time women's conservation leader in Georgia, challenged the ladies to action in the keynote

speech at the workshop last year.

"Knowing how to solve these problems is not enough," she said. "Local initiative must still guide and push resource conservation efforts to completion. If we are to

correct the problems and preserve the beauty of our natural landscape, we must take positive action." As usual, when the ladies force an issue, they get "positive action." ♦

Two-Thirds of Districts Now Have Updated Programs, USDA Agreements

By T. L. Gaston

Resource Development Division, SCS, Washington, D. C.

THE modernization of soil and water conservation district long-range programs, initiated in 1962 by Secretary Orville L. Freeman's offer to use a broadened memorandum of understanding between the districts and the Department of Agriculture, is now completed in more than two-thirds of the Nation's 2,984 conservation districts.

As of June 30, 1,996 of them had revised their programs and entered into the new working arrangements providing for USDA cooperation in "conserving and improving soil, water, vegetative, wildlife, and related resources, and in reducing damage by floods and sedimentation."

A review of more than 200 of the revised district programs shows several significant trends.

One notable fact is the wide participation of people in the development of the programs. This means that ideas from many interests and sources are being tapped, assuring consideration of a wide range of opportunities and alternatives and adoption of sound objectives.

Broad participation

Obviously, the number of people participating in program development varies from district to district. Those participating commonly include district cooperators and people with both agricultural and nonagricultural interests. Groups participating include serv-

ice clubs, stockmen's organizations, garden clubs, sportsmen's clubs, recreation clubs, and the like. Representing governmental interests are people from schools, town and county boards, special purpose districts, and local, State, and Federal agencies with responsibilities in conservation and development of land and water resources.

In developing their programs, the districts usually had the guidance of their State soil conservation committee (board or commission). They have made use of many kinds of information. Most frequently used are summaries of the Conservation Needs Inventory, soil surveys, town and county land use plans, watershed project plans, economic development plans, and census data.

About two-thirds of the districts describe basic conditions and opportunities for improvement by land capability classes or kinds of land. In others, land resource areas are used.

Some of the programs include a brief description of the district's major operating policies, such as time and place of regular board meetings, criteria for determining priorities in planning and application assistance, guides for selectivity in planning, and methods for handling district-owned equipment.

Nearly all programs reviewed had been printed. In many, pictures are used to describe condi-

tions, opportunities for improvement, and the ends sought.

Economic and social effects

In most, the effects of resource conservation and development on social and economic conditions are pointed out. Some included descriptions of current social and economic conditions and the improvements expected.

In updating their programs, districts are focusing their attention

Status of District Programs June 30, 1965

State	Districts Number	Updated programs Number
Alabama	66	51
Arizona	37	16
Arkansas	76	75
California	164	56
Colorado	94	72
Connecticut	8	8
Delaware	3	0
Florida	60	38
Georgia	27	18
Idaho	54	14
Illinois	98	45
Indiana	87	61
Iowa	100	74
Kansas	105	73
Kentucky	121	101
Louisiana	26	26
Maine	16	15
Maryland	24	8
Massachusetts	15	11
Michigan	81	70
Minnesota	89	83
Mississippi	74	73
Missouri	65	45
Montana	62	41
Nebraska	86	67
Nevada	36	15
New Hampshire	10	6
New Jersey	14	13
New Mexico	56	29
New York	48	48
North Carolina	88	40
North Dakota	70	70
Ohio	88	88
Oklahoma	87	59
Oregon	61	19
Pennsylvania	62	4
Rhode Island	3	2
South Carolina	45	44
South Dakota	68	34
Tennessee	95	87
Texas	183	99
Utah	43	14
Vermont	13	13
Virginia	31	12
Washington	69	44
West Virginia	14	12
Wisconsin	72	72
Wyoming	45	2
Alaska	12	2
Hawaii	15	10
Puerto Rico	17	17
Virgin Islands	1	0
Totals	2,984	1,996

on the challenges of today and tomorrow. A current district program widely available to land owners and residents can serve as a guide to local activities in resource conservation and development. In addition to being a foundation for the district's annual work plan, it can influence the activities of individuals, groups, and agencies concerned with the subjects involved. It can also be useful to schools and churches in conservation education. In a number of instances, district programs have become a basis for land planning decisions of town and county officials. ♦

Maine Marshland Becomes Bird Haven

"We've enjoyed birds so much that we decided we wanted to do something about it."

So the Martin Frenches of Dover South Mills, Maine, are planning a sanctuary with Soil Conservation Service help through the Piscataquis County Soil and Water Conservation District.

Their dairy farm of more than 400 acres includes 75 acres of marshland bordering on Branns Mill Pond. With the help of the local soil conservationist and SCS Biologist David N. Allen, the Frenches developed a conservation plan with special wildlife practices. The plan includes nature trails, food plots and shrub plantings, and small watering facilities.

The Agricultural Conservation Program will share the cost of some of the practices.

The Frenches, licensed bird-banders, have recorded sightings of more than 150 species of birds on the farm, including some quite rare in central Maine.

Neighbors, guests, and out-of-State visitors will benefit from the Frenches' conservation thoughtfulness as much as the birds will.—
ELMER A. STEVENS, *Work Unit Conservationist, SCS, Dover-Foxcroft, Maine.*

Security for Missile Sites

Erosion control methods protect Polaris bases at southeastern naval facilities

By A. T. Chalk

State Conservationist, SCS, Columbia, S. C.

EROSION begins when raindrops hit bare soil, whether it be mounded over a Polaris missile magazine, on the slopes of an aircraft runway embankment, on a drill area, or a farmer's field.

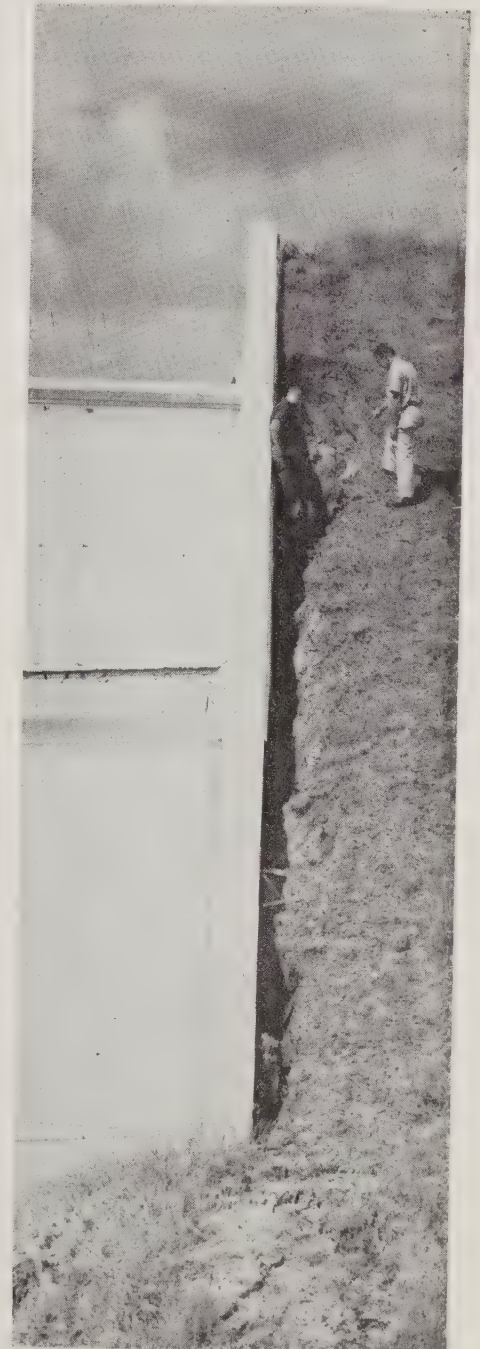
Devising ways to control erosion on the unusual conditions of U. S. Navy installations adds variety and challenge to the work of SCS conservationists assisting them.

Protecting Polaris missiles

At the U. S. Naval Ammunition Depot near Charleston, S. C., Polaris missiles are stored in huge magazines over which raw earth was piled to a height of 15 feet or more. Each rain brought some of the soil down. To hold it in place, SCS Work Unit Conservationist James S. Livingston and his staff recommended a thick-growing sod of grasses and legumes to cover the magazines. The treatment was made a part of the conservation plan worked out with Capt. William Heaman, director, Southeast Division, Bureau of Yards and Docks, under a conservation agreement with the Berkeley Soil Conservation District.

Another part of the Navy complex faced a similar problem at the Marine Corps Air Station, Beaufort, where extension of an 8,000-foot runway required diverting of meandering Mulligan Creek,

The U. S. Naval Ammunition Depot, Charleston, S. C., won the Navy Department's Natural Resources Conservation Award for 1964 and was runner-up for the Secretary of Defense Award. The work described in this article contributed to the achievement.



Earth washing away from a defense building at the Polaris Missile Facility makes a problem for conservationist.

the removal of marsh muck from the extension area, and backfilling with good soil.

The new fill averaged 30 feet in height, with sides sloped as for highways. This valuable embankment had to be stabilized with vegetation, and quickly.

SCS Work Unit Conservationist Ray E. McLin supervises the technical assistance provided to Commander Daniel E. Connelly, public works officer of the facility, on the basis of a conservation agreement between the Air Station and the Beaufort-Jasper Soil Conservation District.

Grasses do the job

"There is no blanket recommendation that can be given for a job of this kind," McLin says. "We use bahiagrass, bermudagrass, and perhaps other plants, depending on the soil types, the slopes of the fill, and other factors. Varying amounts of fertilizer are needed. We recommend a light asphalt mulch to hold the seed in place and give some temporary

cover."

Other problems grew out of the construction job. Lateral ditches spilling into the new channel for Mulligan Creek enlarged into gullies. Sediment washed from them began to fill the channel. Structures were devised to let water in without erosion.

The beautiful lawns of bahiagrass and bermudagrass around the buildings, training grounds, and play areas of the Naval installations at Charleston and Beaufort are conservation measures as well as ornamentation.

The grass must be able to carry heavy traffic and yet maintain a good sod for soil protection. The grass on gently sloping roadsides is kept mowed and gives the appearance of park areas, but the roadsides are waterways that carry runoff water.

Keeping shipshape

Naval officers and enlisted men may be rotated frequently, but there is continuity in carrying out and maintaining the conserva-

tion work.

Keith Lange is natural resources conservationist for the Southeast Naval complex. In that capacity he gives general supervision to the conservation program, to forestry management, to fish and wildlife, and to other natural resources. He works with Federal and State conservationists, foresters, biologists, and other specialists, also.

Russell Dodds, soil conservation engineer in Lange's unit, supervises the soil and water conservation activities in all installations in the Sixth Naval District. Dodds was formerly an engineer with the Soil Conservation Service.

The Navy keeps its extensive land holdings in the Sixth Naval District "shipshape" through soil and water conservation and other resource development programs. Grass and trees that protect the land are important in the same way that paint is important in protecting a ship. Both represent the stewardship of public property, the protection of the taxpayer's investment in defense. ♦

Soil Conservationist J. S. Livingston (l.) discusses a gully problem with J. A. Cox of the Navy.



Soil Characteristics Restricting Root Zone

There are several soil characteristics that restrict plant growth in the root zone and present hazards or limitations to land use. These include low moisture-holding capacity, stoniness, shallowness to layers that limit root development, acidity, salinity, alkalinity, and low fertility that is difficult to correct. The importance of the different limitations varies in different regions. ♦

Tree Windbreaks

Tree windbreaks and shelterbelts have been shown to save 20 to 30 percent on fuel and costs, account for 35 pounds more gain on cattle, control snow drifting, reduce soil erosion, and reduce evaporation. Shade and wildlife protection are additional benefits. ♦

Silt in Water Changes Infiltration Rate and Alters Irrigation Design

By **Martin E. Vavra and Robert F. Pearson**

Engineering Specialist and Civil Engineer, SCS, Uvalde, Tex.

ASIDE from direct damage to crops covered by deposition, silt in irrigation water from major streams or eroding canals may cause serious problems in the design of irrigation systems.

If the layer of sediment laid down on the soil surface changes the infiltration rate, as it commonly does, the system may not function as it was intended.

In the Eagle Pass area of Texas, irrigation water comes from the Rio Grande River. The silt load varies widely, rising to more than 1 percent by weight at times. At other times it is almost negligible.

Field studies by the Soil Conservation Service show that infiltration rates in some instances have been reduced to 31 percent of the original rate after considerable use of the silt-laden irrigation water. Irrigation system designs on these soils have to be evaluated and adjusted often in order to attain proper distribution of water. This is especially true with dense sod and close-growing crops which act as a filter. Silt is deposited whether the irrigation

tab is graded or level. The deposits have some effect on infiltration rates of heavy clay soils and great effect on coarser textured ones.

The seriousness of the problem is illustrated by experience on the Dick Henderson farm near Eagle Pass. One application of 3.5 inches of water left 0.1 inch of silt on the soil surface. At the end of a year's irrigation, approximately 2 inches of silt had accumulated in bermudagrass 50 feet from the irrigation lateral that supplies the water.

Obstruction to flow

A study of a graded irrigation system on the John E. Minnie farm showed that silt had deposited to a depth of 12 inches 50 feet from the lateral during a 3-year period. The field had a grade of 0.1 foot per 100 feet in the direction of irrigation. It was seeded to bermudagrass in 1962 and replanted to alfalfa in 1964. Approximately 60 inches of water was applied each year.

Getting an adequate head of water from the irrigation lateral

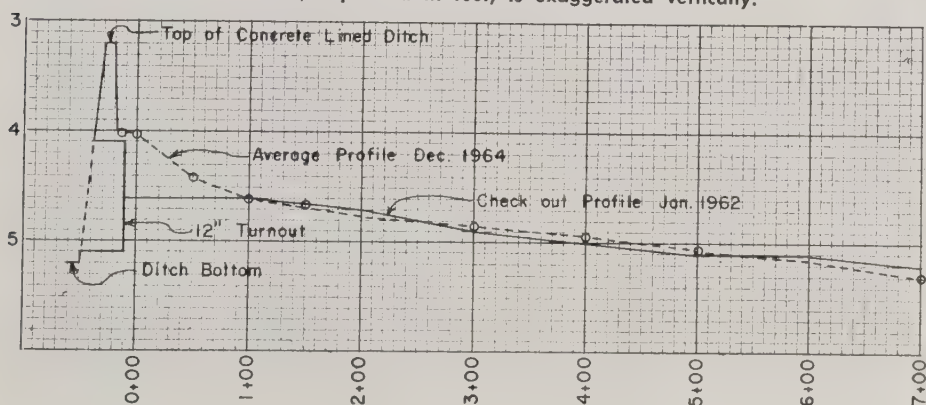
into the tabs is becoming a problem on some fields because of the accumulation of silt near the lateral.

Approximately 40,000 acres is being irrigated in the Eagle Pass area, and large acreages of bermudagrass and alfalfa are being planted. Much of this land will be irrigated with graded systems. The immediate problem is to design the systems for efficient water application now and in the future. The areas planted to bermudagrass



Approximately 2 inches of silt (above) was deposited in bermudagrass during 1 year of irrigation following land leveling. In 3 years (below) 12 inches of silt accumulated 50 feet from the lateral.

Profile of land surface on completion of land leveling (solid line) and after 3 years of irrigation (broken line). The scale, expressed in feet, is exaggerated vertically.



and alfalfa may have to be mechanically renovated to break up the layers of silt so that water can pass through more freely.

Even with renovation, the amount of fine silt deposited and mixed into the plow depth or top 6 inches of the soil may alter the infiltration rate enough to require redesign of the system to get more even and efficient distribution of

water.

An improved vegetative cover and watershed protection measures are needed on the watershed of the Rio Grande to reduce the quantity of silt in the runoff water. In the meantime, conservation farmers and engineers will have to take the silt accumulations into account in designing and using irrigation systems. ♦

Conservationist and Watershed Dam Stand Test of Colorado Storms

THE week of June 14 in Colorado was one of disaster. Floods and tornadic winds wove a patchwork of havoc across the State's eastern half.

It was a period of severe testing of local and public investment in upstream watershed projects. Among them were the Kiowa Creek pilot project and the Big Sandy Creek project, both structurally completed and ready.

A key dam in the Big Sandy project is the mile-long Ramah Dam, built in 1964 with 500-acre-foot capacity added in a permanent pool for fish and wildlife. In this phase of the project the Big Sandy Soil Conservation District was joined as a sponsor by the Colorado Department of Game, Fish, and Parks.

In this storm the Ramah Dam—with others in the project—paid handsomely for the reliance placed in it. Folks generally conceded that it saved the town of Ramah and much of the downstream resources.

Don Smith, SCS work unit conservationist assigned to the Big Sandy District, looks back on June 17 as the most exciting hours of his life. He tells it this way—

I had returned home from Colorado Springs that afternoon after abandoning my car and seeing it swept off the highway by a stretch of high water.

At home I glanced from the window and saw the first water beginning its race down the usually dry creek bed. It meant that the principal spillway in Ramah Dam was discharging.

It also meant a downpour above the dam on the watershed had sent thousands of acre-feet of water into the flood pool. The water level must have risen rapidly.

We got into a pickup and started for the dam. At the bridge a worried group had gathered. It occurred to me that a heavy flow from an area draining into the creek below the dam might cause trouble. I drove back and asked Mrs. Smith to call the people liv-

ing near the creek and tell them of the possibility.

About this time the report was circulated that the dam had failed. If that were true, the danger was vast and imminent. People began calling about it. I didn't know it at the time but a motorist had seen the mighty flow of water across the 600-foot-long emergency spillway. To the untrained eye that was enough to cause panic. Still, I couldn't believe the dam was failing under any conditions. I had seen it built, inch by inch, with the best engineering supervision and the best equipment available.

I decided to check. My son, Woody, and I drove to the dam. It was pitch dark, and the wind was hard from the southwest.

We got to the dam and walked its length by the light of a flashlight. I had never expected to see the water that high, within 2 feet of the dam's crest. The emergency spillway was a mighty cascade 3 feet deep.

I could see the water was receding slowly. We drove back and called the telephone office. It was nearly 2 a.m. but the operators—bless 'em—agreed to pass the word that the dam was safe, that the town was in no danger. Then at home we crawled into our beds for a few hours of rest. ♦

The mile-long Ramah Dam stands intact after intense storms had sent water over emergency spillway.



PRESIDENT Johnson's call for beautification of the Potomac River basin and development of its recreation potential finds response in the small watershed projects and land treatment measures already completed or under way in the Potomac watershed.

The President's charge, contained in the White House Message on Natural Beauty, points up the efforts already made by Federal and State conservation agencies to restore and preserve the natural resources of the Potomac valley.

The U. S. Department of Agriculture has been working for a long time to achieve many of the features considered essential elements of a plan for the Potomac.

Cooperation between land owners and operators, and Federal, State, and local authorities, has given a headstart to a concerted drive to make the Potomac run clean again and have its valley used wisely wherever the hand of man touches it.

The progress has been gratifying. Yet, statistics clearly show the need for still greater effort before the Potomac will "serve as a model of scenic and recreation values for the entire country," which is President Johnson's aim.

The 14,780 square miles of land draining into the river contribute about 2.5 million tons of mud, silt, clay, and organic debris to its estuary each year, according to SCS specialists. In addition to this sediment, the river carries a large load of dissolved materials. Scientists estimate that the annual chemical load past Washington is 1.4 million tons.

Urban development has contributed heavily to the conservation problems in the Potomac basin. Land damage in the form of flooded tributaries, silt-laden currents, and sediment-clogged channels fol-

For beauty, pleasure, utility . . .

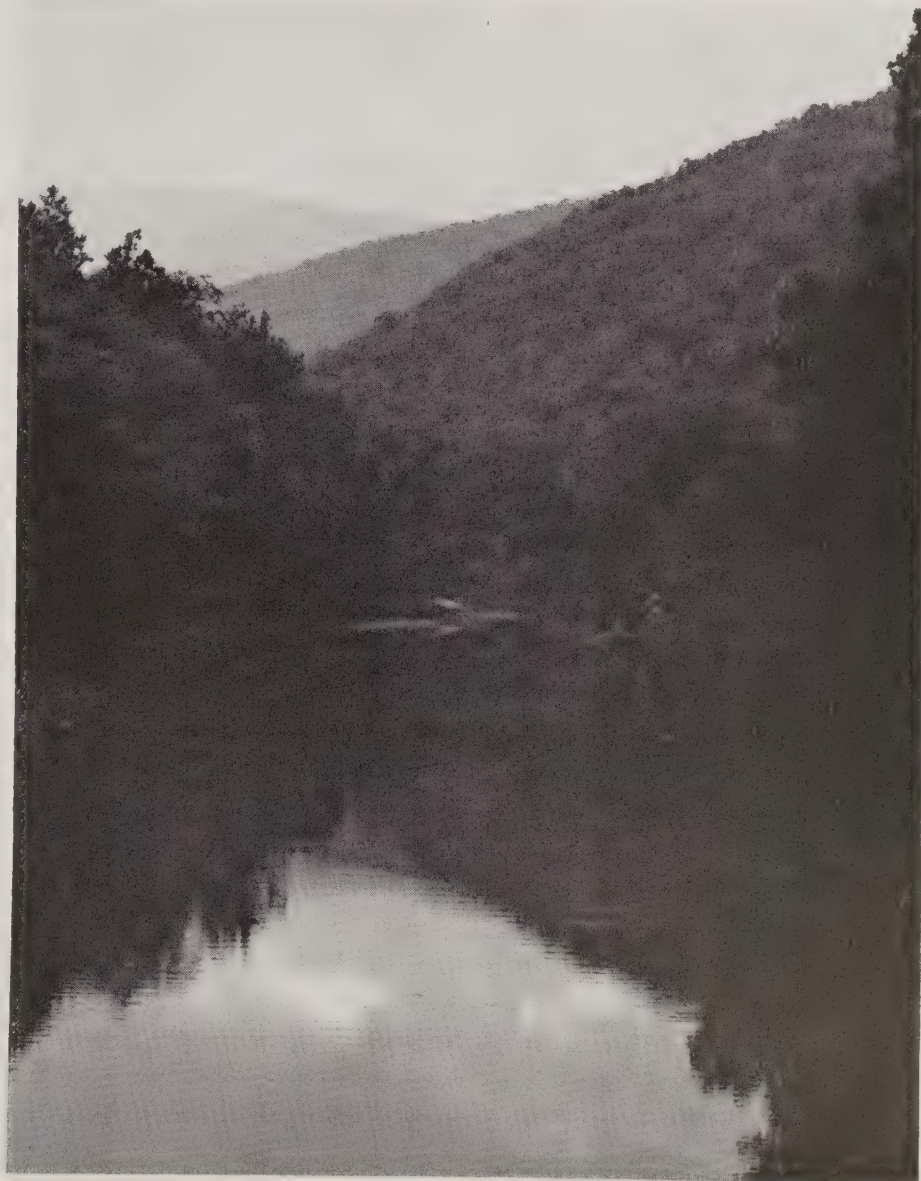
Small Dams, Conservation Help Make 'Model' Potomac

low the trail of the bulldozer.

A major sediment source area is in that portion of the basin above Washington which has an 11,500-square-mile watershed. Nearly 9 million acres in this part of the basin is classed as agricultural land. Less than half of this acreage is cleared. Although the work of the soil conservation districts

has been advancing in the upper Potomac region, much remains to be done to assure adequate use and treatment of farmlands.

SCS began assisting Potomac basin farmers with their soil and water conservation problems 30 years ago. Local soil conservation districts have been working with SCS for almost as long.



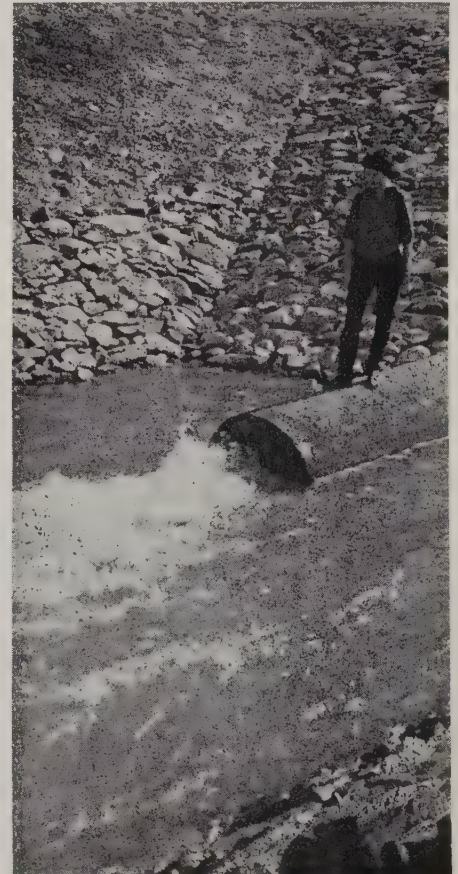
The lasting beauty of the dark reaches of the upper Potomac depends on permanent protection by well-managed forests, conservation-treated farmlands, and small watershed dams.



Many landscapes in the Potomac basin attest to the sound conservation practices applied over the years.

Floodwater-retarding dam in West Virginia serves also as a municipal water supply.

Riprap protects the toe of a small watershed dam where an outlet pipe empties overflow water downstream.



Federal and State Extension Services of the basin States have pioneered educational work in soil and water conservation.

The Agricultural Stabilization and Conservation Service has been providing cost-sharing payments to help in the installation of selected conservation practices; and the Farmers Home Administration has been arranging loans for conservation improvement.

The whole Potomac basin with the exception of parts of Fauquier County, Va., is in soil and water

conservation districts. There now are 22 conservation districts partly or entirely within the basin. Nearly half of the 43,000 farmers in the basin are district co-operators. About one-third of these have basic conservation plans.

More than half the Potomac basin is in forest. Multiple-use management of more than 200,000 acres in the Monongahela and George Washington National Forests has resulted in evident conservation and improvement. Additional national park and State-

owned land, which also are being improved constantly, bring the total of public land in the basin to about 13 percent.

Despite a long history of abuse and deterioration, the now-improving forest resources, the rugged mountain barriers, rolling hills, and verdant valleys of the Potomac present a unique and striking area of natural beauty.

The landmark Flood Control Act of 1944 authorized extensive Federal participation in efforts to reduce floods and erosion damage through structural and land treatment measures. An area of 4,205,400 acres in the upper basin was brought under the act as one of 11 major flood prevention projects in the Nation. The project area comprises about 57 percent of the basin above Washington.

Subwatershed work plans have been completed for 9 locations, and planning is under way for 2 others. Construction is finished in 3 locations with the installation of 8 floodwater-retarding structures and 5 channel improvements. Construction is under way in 6 other locations where approximately 100 structures are being built.

Because a large part of the Potomac upper basin is being treated under the 1944 act, there is limited use of the watershed protection and flood prevention program under Public Law 566. One Public Law 566 application is pending, one project is approved for planning, and two projects are approved for construction.

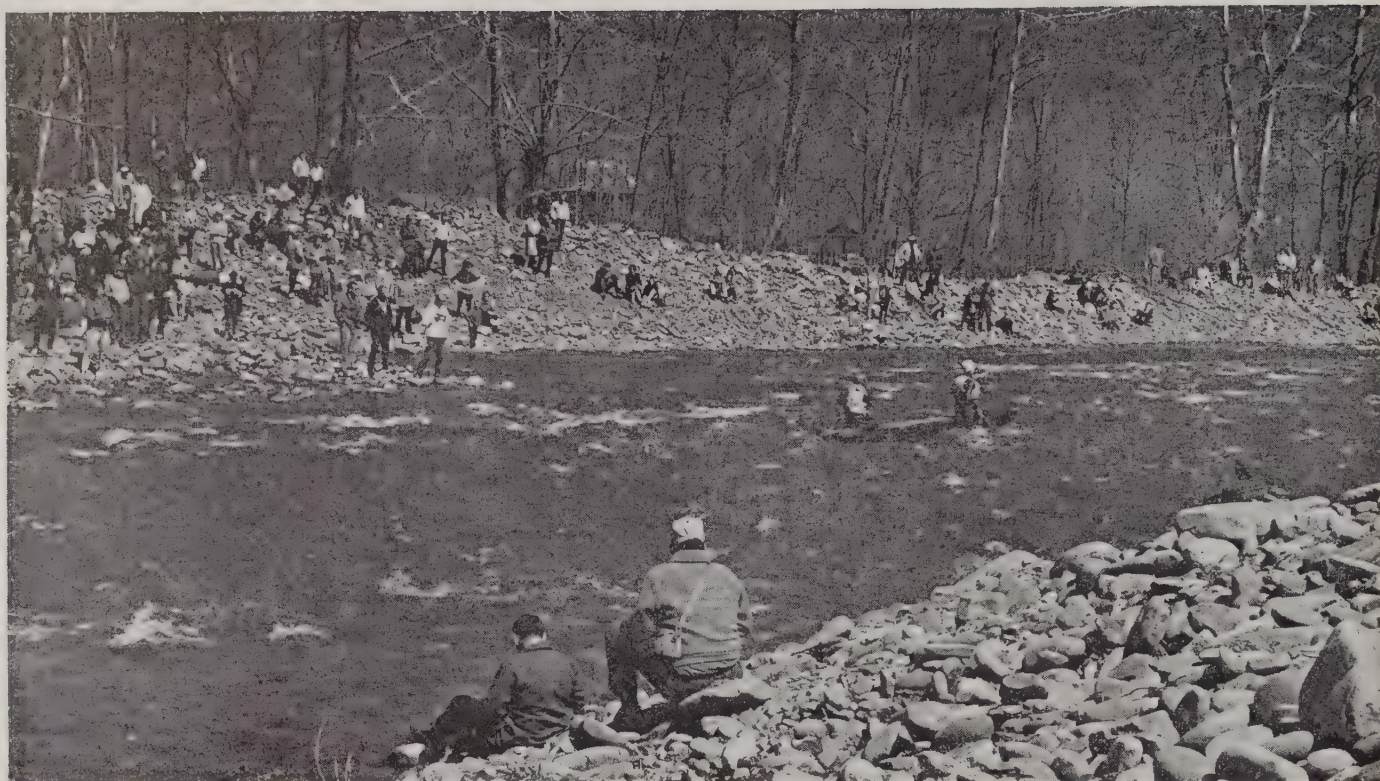
In the report following a recent coordinated survey of water and related resources of the Potomac basin, USDA and the Army Corps of Engineers recommended construction of 418 upstream reservoirs as an element of a comprehensive plan. These reservoirs would be of the same general type as those being built under Public Law 566.

A review of this study would place more emphasis on recreation and fish wildlife enhancement in the basin.



Where effective conservation measures are not employed during construction (above), urban developments contribute heavily to stream sedimentation. Soil stripped of its natural cover was left unprotected for 2 years during construction of a highway (below) near Washington.



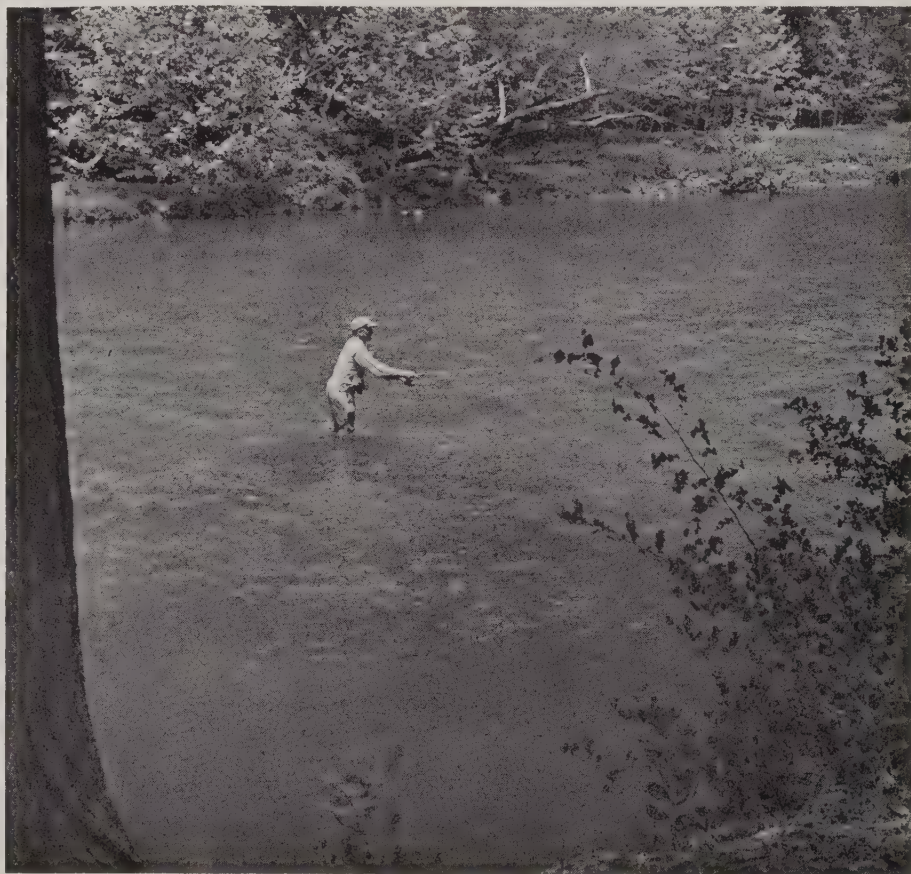


Water sports, like this canoe race (above), are popular on the Potomac and its tributaries. Small watershed structures protect these major streams, leaving the watercourse open for navigation. Recreation and rustic beauty (below) go hand-in-hand where waters run clean between protected streambanks and conservation-treated uplands.

As sound conservation practices are applied to the upper Potomac basin, security of its treasure of natural beauty nears reality. Already, subwatershed land improvements visibly enhance the approaches to outstanding tourist attractions, such as the Shenandoah National Park on the Blue Ridge, Harper's Ferry National Park, Cacapon State Park in West Virginia, and George Washington and Monongahela National Forests.

Carefully managed carpets of pasture, well-tended woodlots, and scientifically contoured croplands all testify to long-term cooperation between landowners and conservation agencies in the Potomac River basin.

The going programs of the USDA are an integral part of the Potomac River improvement plan. For years they have made a substantial contribution toward developing the Potomac valley as a model of beauty and a center of outdoor recreation for the Nation. ♦



Where to put it—that's the problem

Sediment Basin Is Crucial In Watershed Dam Design

By John W. Roehl

Geologist, Engineering Division, SCS, Washington, D. C.

MOST of the structures in watershed protection projects are built for the primary purpose of retarding floodwaters and protecting valley lands from damage.

High among the damages to be avoided are the deposits of sediment on bottom land fields and pastures, on roads and streets, and in flooded buildings.

To the extent the dams are successful in holding back sediment, they create a hazard to their own effectiveness that could eventually put an end to their usefulness.

So, provision for storage of sediment is a crucial part of the design of each floodwater-retarding dam. SCS geologists can predict the rate of sedimentation in each watershed, and engineers can then plan each structure to function under the expected conditions, after practical land treatments have been applied.

A useful life

When other purposes are added to flood prevention—as is the trend today—the problem becomes even more complex. More and more projects are planned also for water supply for irrigation, urban, or industrial use, for fish and wildlife habitat, and for recreation.

The structures are designed and built to provide their intended function for a specified number of years—usually 50 to 100—and provision for the expected accumu-

lation of sediment must be taken into account. Otherwise, the sediment would encroach on the storage space provided for the supplementary purposes, and the structure would soon fail to function as intended.

Product of erosion

The sediment storage required in a reservoir depends on a number of different factors. These include the amount of erosion occurring in the drainage area of the reservoir; how much of the eroded material will be brought down to the reservoir; how the sediment will be distributed within the reservoir; and what its ultimate volume will be.

SCS geologists have studied these factors in detail and have evolved streamlined procedures for rapid estimation of the sediment storage

requirements of watershed structures.

Since sediment is the product of erosion, the first step is to determine the amount of erosion occurring in the area draining to the structure. Sheet erosion is computed by a standard equation that takes into account the character of soils, the land use conditions, length and degree of slope, and rainfall. Amounts of channel erosion, such as that derived from gullies, streambanks, and roadsides, are determined by local field studies.

Not only must the geologist determine the amount of erosion occurring at the time of planning, but he must anticipate the reductions that will be achieved by the application of land treatment measures, which are an integral part of any watershed protection project.

Not all of the soil material eroded from the uplands will reach the reservoir, of course. Much of it will be deposited on the lower-lying portions of sloping fields; some will be caught in grassed areas; and some may be deposited

Sediment deposits on bottom-land fields are one of the principal damages to be prevented by watershed protection projects.



This article is based on an unpublished manuscript by the late L. C. Gottschalk written shortly before his retirement from the position now held by the author.

on flood-plain areas during high-water flows.

So, as the second step, a correction factor is applied to the erosion estimate to determine how much of the eroded material will reach the reservoir as sediment. This correction factor is termed the "delivery ratio," and studies have been made that relate this ratio to several influencing factors, such as the size of the drainage area, the stream length, watershed relief, and others.

Trap-efficiency

The next step is to determine how much of the sediment reaching the reservoir will remain in it. A portion of it will be deposited in the basin, but a part will pass on through the structure and on downstream. The ability of a reservoir to retain a portion of the incoming sediment is termed its "trap-efficiency."

Trap-efficiency varies with each reservoir and is influenced by several factors. The Soil Conservation Service is making measurements of the trap-efficiency of a number of reservoirs throughout the country to obtain basic data

concerning this factor of design. The sizes of the sediment particles, the electro-chemical nature of the water, the shape of the reservoir, the length of time the water-sediment mixture is stored, and the annual water inflow are among the items being considered in the study.

Until the data are collected and analyzed, however, SCS geologists are using the relationship between trap-efficiency and the "reservoir capacity—annual inflow ratio" to estimate the amount of sediment that will remain in the reservoir.

These three steps tell how many tons of sediment must be provided for by the structure. Now the geologist must determine how much space must be provided to accommodate the deposits and where it will be located. If too little space is provided, the pool is under-designed and the sediment will encroach on space intended for other uses; if too much, the pool is over-designed and the cost of the structure is more than it should be.

Two kinds of deposition

One might think that all the sediment would ultimately lodge in the lowest parts of the reservoir.

But not so. Some of it is deposited at upstream portions of the lake where it is under water only during high water stages and is subjected to the drying action of the air at intervening times. Other sediment reaches the lower parts of the pool and may never see the light of day again.

These two different environments of sediment are described as "aerated" and "submerged," and the proportions of each are important in designing the sediment basin. The ratio of aerated and submerged sediment is determined in part by the sizes of the particles. If there is a predominance of large material, such as sand and gravel, a relatively greater portion will settle out in the backwater areas and be subjected to alternate drying and wetting. Conversely, if the material is nearly all silt and clay, most of it will be deposited under water.

Why should this make a difference? Because a given weight of sediment occupies more space if constantly submerged than if aerated. This volume-weight ratio will vary from nearly 3 to 1 for submerged sediment to about 1.4

Much of the sediment stopped by a flood-retarding dam accumulates at the upper end of the lake.



to 1 for aerated sediment. Thus, more space must be provided for a given number of tons of sediment in the submerged condition than for the aerated.

Another factor that must be considered is that sediment compacts as more is deposited, and this, too, bears on the final amount of space

that must be provided.

The geologist takes all of these many factors into consideration as he develops sediment design information for a reservoir.

The engineers and planners then can make realistic decisions about the useful life and cost of each structure. ♦

Conservation Combined With Camping Wins USDA Award for Boy Scouts

By Stuart O. Hale

Outdoor Writer, Providence (R. I.) Journal and Bulletin

RHODE Island's Narragansett Council, Boy Scouts of America, had a host of problems to solve in maintaining the natural beauty of its 2,100 acres of Scout reservations while supporting one of the most intensive camping programs in the Nation.

At the Yawgoog Scout Camp in Rockville, the largest boys' camp in New England, as many as 1,200 boys use the facilities each week during the summer season. Outpost camps in other locations also receive similar hard use.

Long-range plan

Working with conservation plans developed in cooperation with the Rhode Island soil and water conservation districts and assistance of SCS conservationists, State foresters, and others, the Scouts set to work to fight erosion, reforest blighted regions, and prevent forest fires. They set out on a long-range sustained-action soil and water conservation program.

Last year's achievements won them the 1964 USDA Gold Seal Conservation Award, the highest honor in a nationwide program of recognition for conservation achievements in Scouting.

Since the program was initiated in 1960, only 3 councils have received the Gold Seal Award for the best conservation program in the Nation. Green Seal Awards have been given to 55 councils for regional excellence.

There were serious erosion problems at Yawgoog where as many as 10,000 pairs of feet tramp out the grass on slopes leading down to a half-mile-wide pond. As a part of the conservation plan, a series of miniature diversions were constructed, hard-used traffic lanes were closed, and new ones opened. Some worn areas were seeded and protected until they could be opened for use, while others were closed for more extensive rehabilitation. An old dam was repaired to recreate an 8-acre wildlife pond. New fire lanes were constructed.

Fire scars healed

At Kelgrant, on the Pettaquamscutt River, a forest fire in 1961 had denuded some of the best acreage. Last year 22,000 trees were planted, and thousands of young pine seedlings planted previously were released from undesirable overtopping growth. The fire, incidentally, was not started by Boy Scouts but by careless campers just outside the Scout reservation.

At Champlin Reservation, on the edge of the Providence metropoli-



Tree and shrub plantings for cover and soil protection were part of the conservation plan.

tan area, a "showplace" scouting area has been established that receives intensive day and overnight use.

Here a fine trout pond was built and the stream channel was improved with riprap, grading, and seeding. A short ski slope was seeded and fertilized, and 2,000 trees and shrubs were planted for cover and soil protection. An erosion problem created by relocation of a State highway was solved by construction of a stone barrier to divert excess runoff water.

Working with Scout troops that go on assigned patrol duty and using an old fire truck, the Champlin staff has developed a special protection program during forest fire season.

At Aquapaug, an outpost camp on Worden's Pond, Scouts planted 10,000 trees and cut fire lanes.

In nearby Rehoboth, Mass., on the Buxton-Frontier area a swimming hole was created on the Palmer River, fire lanes were built,

Mr. Hale is current winner of the Meeman Conservation Award sponsored by the Scripps-Howard Foundation. All photos are courtesy of the *Providence Journal*.

and the shores of the river were cleaned up and seeded. Using a soil survey the Scouts located the best areas for a playground and parking lot.

In northwestern Rhode Island, the Narragansett Council maintains a 275-acre tract called Winnesuket, on the shores of Wakefield Pond. Here some fire lanes and trails have been built, and a continuing conservation plan is being followed to enhance wildlife values and develop a woodland management program.

Conservation training

Narragansett Council is an organization of nearly 25,000 boys and adult leaders, the majority of them from urban communities. As a result, much of their conservation training is through the Scout program. In addition to weekend work parties, which on occasion have numbered several thousand boys and leaders at a time, the council supports an education program.

Each summer at Yawgoog, six conservation films are shown to thousands of campers. Last year

The beauty and peacefulness of nature, a fire trail, and a road—all in one.



A group of Boy Scouts cuts saplings to prepare the way for a fire trail.

troops from throughout the State and nearby Massachusetts sent several hundred leaders to a special

conservation workshop at the big base camp. Over a 3-day period the boys received training from SCS conservationists, State forestry and fish and game technicians, and others. Each then returned to his individual troop to pass his newly acquired knowledge on to other Scouts. ♦

More Districts Subscribe To Our Magazine

The Upper Salinas, Las Tablas, and Parkfield-Cholame soil conservation districts in California not only pay for subscriptions to *Soil Conservation* for each of their 15 directors, but they go even further. They subscribe for the magazine to be sent to various elementary and high schools in the area and to be placed in 12 doctors' waiting rooms. ♦

Annual Cassoday Lion's Hunt Draws Sportsmen to Kansas Town

By Glen P. Snell

Range Conservationist, SCS, Emporia, Kans.

EVERY fall, for the past 4 years, some 800 to 1,000 hunters have converged on Cassoday, Kans., population about 100, to participate in the "Cassoday Lion's Hunt."

The event, sponsored by the Cassoday Lion's Club, marks the opening of the prairie chicken hunting season. Proceeds from the hunt are used for community services.

Lion's Club members contact farmers and ranchers within a 15-mile radius of Cassoday for permission to hunt the prairie chickens on their land. The landowners are not paid, but they are protected against damage to their property by insurance included with the permits issued to the hunters. Permits for the first 2 days of the prairie chicken season sell for \$2.

The hunter is given a map showing land in the Butler County and Chase County soil conservation districts on which he may hunt. For \$1, a hunter can roll out his sleeping bag on the basketball court of the Cassoday Grade School building, or sleep on a gym mat. For an additional \$1 he can have a hearty breakfast, which is served beginning at 2:30 a.m.

The hunters start moving out about 4 a.m. They wait in the prairie grass for the chickens to come flying in to feed on the nearby milo fields.

The tall prairie grass is the natural habitat for the prairie

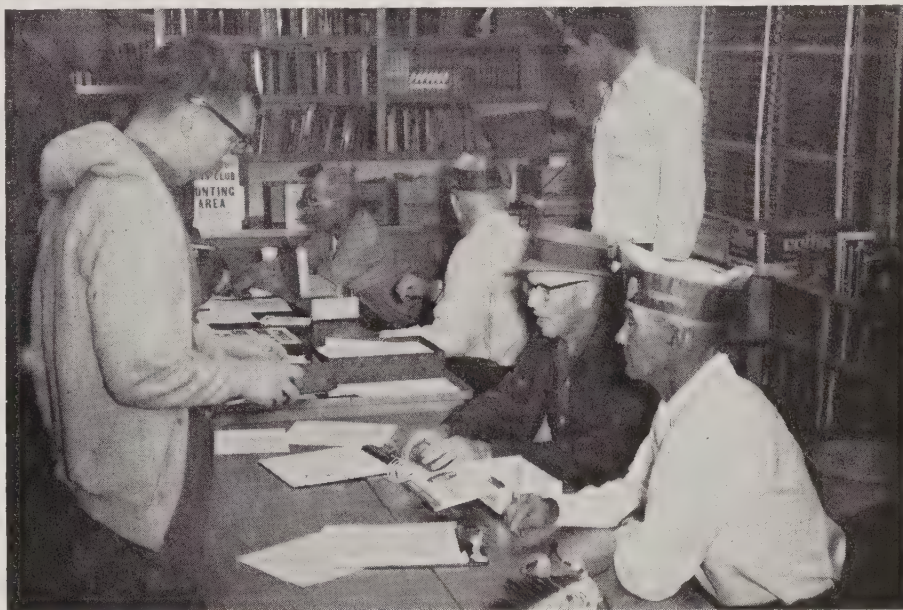
chicken. Adjacent fields of milo, soybeans, and wheat add to the fall diet of these birds and serve as a point of concentration from which they can be hunted.

Prairie chickens must have good

native grass cover in the spring when they nest. At least half of the previous year's growth of major grasses should remain as winter and spring nesting cover.

As long as the rangeland is properly grazed, there will be a good habitat in the bluestem hills for prairie chicken production. As long as men respect their hunting privilege, hunters can safely harvest the birds on grounds made available by cooperating landowners. ♦

Hunters are registered and sold permits on the day before the prairie chicken hunt begins.



George Odgen and sons, Ron and Jim, from Wichita, Kans., have had a successful hunt on their first day out.

Farmer Helps His Neighbors Plant Pines to Replace Cultivated Crops

By C. M. Henninger

Woodland Conservationist, SCS, Nashville, Tenn.

THROUGH his enthusiasm and influence, James Leggett of Big Springs Community in Meigs County, Tenn., has stimulated reforestation and woodland management in his community, although he owns only 68 acres of his own.

In the 1964-65 planting season, 41,000 pine seedlings were planted by Leggett's neighbors and relatives, largely as a result of his leadership, says Edd Norman, chairman of the Meigs County Soil Conservation District.

In recognition of his conservation work, the board appointed Leggett as an assistant soil conservation district supervisor. In this new position, he will take part in an advisory capacity in all board meetings.

When James Leggett bought a 98-acre farm in the Big Springs Community in 1942, his six children helped him carry on his farming program. About 40 acres were devoted to raising cotton, tobacco, corn, hay, and truck crops.

Less labor

"But children have a way of growing up and seeking greener pastures," Leggett explained. "As each one graduated from high school and went to work or got married, my labor force dwindled. The last one left home about 10 years ago."

Earlier, Leggett got a job driving a Meigs County school bus, and for the last 16 years he has been an employee of the Meigs County Board of Education. Since this work also cut into the time he could devote to farming, the acreage planted to crops declined and some of the land lay idle.

"I had more land than I could handily tend," Leggett said, "so

in 1957 I sold about 30 acres to a paper company."

The paper company had recently built a mill 10 miles from Leggett's farm. The new market for pulpwood stimulated interest in timber growing in the community and promised a market for young trees.

In 1959, Leggett decided to grow trees on his extra land. E. H. Whitaker, SCS work unit conservationist assisting the Meigs County District, helped obtain seedlings from the Tennessee Division of Forestry and showed him how to plant them. Leggett reforested 7 acres and each succeeding year planted a few more acres. The Agricultural Conservation Program helped share the cost.

Conservation plan

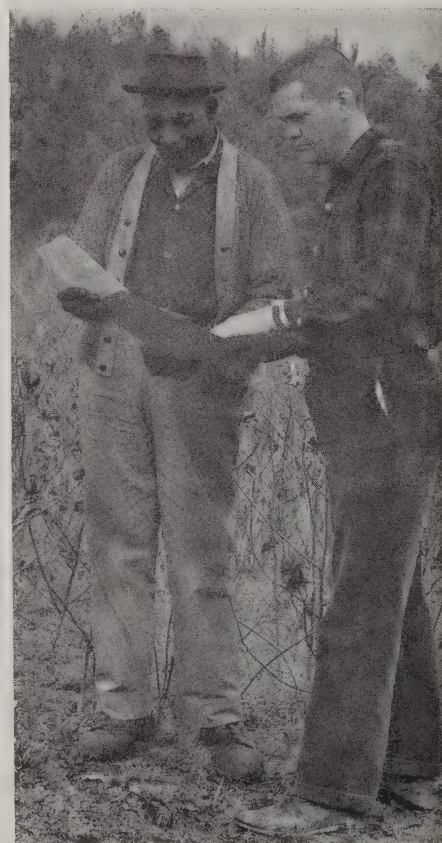
In the spring of 1963, Leggett developed a conservation plan with the district for his 68 acres. Using a soil and land capability map prepared by SCS Soil Scientist R. B. Warren, Leggett and Whitaker selected 12 acres of his best land to be farmed in a 3-year rotation of cotton, oats, and lespedeza. Seven more acres planted to loblolly pines brought his total of new pines to 22 acres.

There were also 33 acres of second growth pine and hardwoods. Most of the hardwoods had been severely damaged by fires in the past and were of little value even for pulpwood. To allow the more valuable pines to grow, the woods needed the low grade hardwoods weeded out.

Leggett has completed the reforestation of his open land and is ready to start weeding his natural woods. He will use a tree injector, loaned by the district. ♦



James Leggett (above) admires 5-year-old loblolly pines on former cotton land. The pines will be ready to thin for pulpwood when he retires. Standing in a cotton field (below), he and Work Unit Conservationist E. H. Whitaker examine Leggett's conservation plan.





CONSERVATION PROFILE

George Bagley

Louisiana

Former accountant takes lead in conservation

THEY say if you want to get a job done, find a busy man to do it. George R. Bagley, St. Joseph, La., fits the description. He is busy. He gets the job done.

Cotton farmer, cattleman, secretary-treasurer of the Tensas-Concordia Soil and Water Conservation District of Louisiana, president of the Louisiana Association of Soil and Water Conservation District Supervisors, area vice-president (area IV) of the National Association of Soil and Water Conservation Districts, and member of the Louisiana Water Resources Committee all are titles belonging to George Bagley.

He is a member of the Tensas Parish Gravity Drainage District No. 2, a graduate accountant and businessman, a World War II Naval Officer, member of the Soil Conservation Society of America, the Farm Bureau, the Louisiana Forestry Commission, the Louisiana Cattlemen's Association, and Louisiana Delta Council.

Prime mover in watershed

He was a prime mover in the North Tensas watershed and serves on the board of directors. His influence spurred the organization of the South Tensas watershed, recently approved for planning. Nearly every acre of his home parish is now included in a Public Law 566 watershed project. The North Tensas watershed is almost completed.

Because he is a responsible citizen and good businessman he is a stockholder in a number of institutions. These include a chemical company, a 12,000-acre plantation, a life insurance company, and two banks. One of the banks was founded by Mrs. Bagley's father at Newellton. The other is at St. Joseph, both in Tensas Parish.

Bagley and his friend, Richard Thompson, of Colfax, La., chairman of the State Soil and Water Conservation Committee, are mainly responsible for a \$90,000 appropriation by the Louisiana legislature last year, to speed up watershed planning in their State.

He is a member of the Louisiana Advisory Committee on Conservation and Resource Use Education and is a working proponent of conservation education wherever the opportunity occurs.

On people-to-people tour

Last year George joined a group taking a people-to-people tour of Europe and Soviet Russia. He brought back pictures and impressions with which he has spread the word about land use and treatment in that part of the world.

Meanwhile, back at Sunnyside Plantation, George and Barbara Bagley have established a conservation showplace.

When they took charge of their holdings in 1948, they fenced each field in rectangles with square corners. But after they studied their soil and capability map and made their conservation plan they decided that wouldn't do. So they tore down the fences and started all over. This time, they fenced according to land capability boundaries.

George had taken a year's leave from his accounting firm in Indiana to come to Louisiana and get Barbara's grandfather's estate on a sound basis. That was 1948. That year has stretched into 18 crop seasons, 3 lovely children, a beautiful home on the shore of Lake Bruin, and solid citizenship in Louisiana.



Serious about conservation

Rebuilding fences wasn't the only sign that the Bagleys were serious about using the land within its capabilities and treating it according to its needs. If the land was heavy clay and not suited to continuous row crops, he planted grass on it. Now there are 658 acres of improved pasture that provides grazing and hay for his 300-cow beef herd.

Cropland on the Bagley's Sunnyside Plantation grows cotton —on the land best suited to row crops and rotated with small grain, corn, and millet or sorghum. Some of the land has been leveled for better drainage and more efficient use of irrigation water. Ten miles of drainage ditches have been installed to conservation specifications.

Besides the 658 acres they own, the Bagleys rent another 585 acres from a relative and supervise the renting of another 1,078 acres. Their conservation accomplishments spread over all, owned or not.

George is a district cooperator in another State. On his grandparent's land he is applying two conservation plans with the Madison County Soil Conservation District in Indiana. His great-grand-

father received a government land grant in 1833, and the land has been in the family since then.

Barbara is a conservationist, too. In addition to keeping George's calendar in line she is active in the State, area, and National Ladies Auxiliary of Soil and Water Districts. ♦

Tom Dale

Writer, Editor 1899-1965

Tom Dale, former editor of *Soil Conservation*, 1956 to 1961, died at Leesburg, Va., July 11. He was born at Headrick, Okla.; graduated from Oklahoma State University in 1923, and did graduate work at Colorado State University. He worked for the Soil Conservation Service from its beginning in 1935 until his retirement in 1961.

Tom Dale was one of the crusading conservationists of the Thirties who aroused the public to the problem of soil erosion. He began his career with SCS (then the Soil Erosion Service) traveling in Oklahoma with Regional Director N. E. Winters and speaking to meetings by day and by night. A vigorous disciple of Hugh Hammond Bennett, he served as regional information officer at Salina, Kans., and Amarillo, Tex., before coming to Washington in 1945.

He was author of a book, *Topsoil and Civilization*, published by the University of Oklahoma Press in 1955 and later translated into several languages.

For the Soil Conservation Service he wrote the following pamphlets published, except for the first, by the Department of Agriculture:

1940. *Conserving Farm Lands*. With W. A. Ross. U. S. Department of the Interior, Vocational Division Bulletin 201. 104 pages, illus.

1941. *Conservation Farming for the Hard Lands of the Southern Great Plains*. Unnumbered. 27 pages, illus.

1941. *Conservation Farming for the Sandy Lands of the Southern Great Plains*. Unnumbered. 25 pages, illus.

1941. *Conservation Practices for the Range Lands of the Southern Great Plains*. With J. S. McCorkle. Unnumbered. 32 pages, illus.

1945. *To Writers of the Soil Conservation Service: How Does Your Writing Read?* Unnumbered. 8 pages.

1947. *When Drought Returns to the Great Plains*. Farmers' Bulletin 1982. 14 pages, illus.

1948. *Writing for Your Readers*. Unnumbered. 22 pages.

1950. *For Insurance Against Drought—Soil and Water Conservation*. Farmers' Bulletin 2002. 22 pages, illus. Revised 1962.

1955. *Grass Crops in Conservation Farming*. With Grover F. Brown. Farmers' Bulletin 2080. 22 pages, illus.

In addition, Tom Dale wrote many leaflets, articles, and speeches unidentified by his byline. ♦



To Save the Soil. BY NAOMI TALLEY. 1965. Dial Press, New York. 79 pp., illus. \$2.95.

This brief, concise book for children from the fourth to the seventh grades is one of the better children's books on soil conservation to come out in recent years. The author tells the story of the formation of the soil, of man's misuse of it, and of his efforts to conserve it while using it to meet his needs. Pioneers in soil conservation are introduced to the reader. Attention to recent developments in soil conservation, including the work of soil conservation districts, makes this a modern book.

Mrs. Talley is a former school teacher, former employee of the

Soil Conservation Service, and feature writer for newspapers and magazines. With this background she is well qualified to produce a book in the field of children's literature, where the need is so great. —A. B. FOSTER.

New Publications

New Opportunities in Rural Recreation. BY SOIL CONSERVATION SERVICE. 1965. *Script for slide presentation*, 50 pictures. This is the first of a new series of informational materials. The leaflet contains black-and-white reproductions of the slides and a brief narration to go with each. The slides can be purchased from the Photography Division, Office of Information, USDA, for \$5.50 a set. Filmstrips are available from Photo Lab., Inc., 3825 Georgia Avenue, N.W., Washington, D. C. 20011, for \$5.00 each.

Soil and Water Conservation Activities: A Guide to Leaders of Girl Scouts. BY ALBERT B. FOSTER AND ADRIAN C. FOX. 1965. USDA PA-664. 30 pp., illus. The fifth version of this popular booklet of conservation projects for young people. Previous editions were addressed to teachers, Camp Fire Girls, Boy Scouts, and 4-H Clubs.

Public Water Supplies of the 100 Largest Cities in the United States. BY CHARLES N. DURFOR AND EDITH BECKER. 1962. U. S. Dept. of Int., Geol. Surv. Water Supply Paper 1812. 364 pp., illus., maps, tables. \$2.00. A general discussion of public water supplies of metropolitan areas followed by data for specific cities.

Soil Surveys

Covington County, Mississippi. BY WALTER E. KENNAN AND WILLIAM A. COLE. 1965. 91 pp., illus.; maps 4 inches to the mile (1:15,840). Field survey by Walter E. Kennan, Robert E. Fulgham, Kenneth H. Byers, Morris E. Shaffer, and Lewis R. Watts.

Washington County, Florida. BY H. F. HUCKLE AND H. H. WEEKS. 1965. 119 pp., illus.; maps 4 inches (1:15,840). Others participating in the survey were E. M. Duffee, A. L. Furman, M. L. Harrell, M. W. Hazen, Jr., K. J. LaFlamme, B. W. McEwen, and B. P. Thomas.

Warren County, Mississippi. BY WILLIAM A. COLE AND R. C. CARTER. 1964. 73 pp., illus.; maps 4 inches (1:15,840). Fieldwork by H. C. Lane, V. H. McGehee, and William Clark.

From the Administrator:

Conservation Careers



THE idea of conservation careers—their development and fulfillment—has been deeply engrained in the Soil Conservation Service ever since its beginning as a nationwide agency back in the Thirties. It is so much a “way of life,” rather than a set of procedures and policies on paper, that we in the Service tend to take conservation careers for granted.

A year like 1965, with its succession of distinguished careerists leaving SCS by retirement, gives us a fresh awareness of our career system.

There is something genuinely right about a system that gives us such men as J. C. Dykes, known throughout the country for his pioneering contributions to soil and water conservation; a cause that claims 30, 35, or more years of dedicated service from such leaders in their respective fields as Bill Allred, Ray Walker, Ed Graham, Paul Jacobson, “Bones” Norton, Felice Orsini, Ed Swain, Arch Work, to name only a few.

We need to remind ourselves of the critical importance of the human resources, the organizational “climate,” and, yes, the good old-fashioned hard work required to establish and nurture a career system that makes the SCS a leader in the conservation field.

It is no accident that when these important people joined the growing number of “SCS Conservationists Emeritus,” we had within our own ranks not just one but, in most cases, a good number of excellent candidates from which to fill their diverse and crucial jobs.

Just review in your mind the replacements already announced: Among them Norm Berg for J. C. Dykes, Courtney Tidwell for Ray

Walker, Ken Cornforth for Paul Jacobson, Fred Prange for Ed Graham, Ken Grant for Ed Swain, “Spike” Koechley for Felice Orsini—the list goes on and on. Watch these personnel announcements as they come out; they are milestones in our SCS career development program.

If all this is no accident, how did it come about? It has come about through the early adoption Servicewide of a career policy and program resting on a very simple base—the determination to recruit quality people and provide them with opportunities for self-development so that a substantial reservoir of “best qualified” conservationists would be available for each vacancy that develops.

Notice that I say “conservationists.” I mean that to include *all* of our positions. It is important to the progress of the Service that all its employees, whether they serve as soil conservationists, range conservationists, design engineers, or State administrative officers, develop their specialized skills and careers in the setting of conservation and motivated by the philosophy of conservation.

Lest all this sound too easy or too academic, let me be more specific about what it takes to carry out such a basic policy.

First, recruitment can never be a casual, end-of-the-fiscal-year business. Recruitment must be a real and effective “quest for excellence.” We must seek the *best* of the graduating classes. We must use the student trainee program consistently, not sporadically, to bolster our work force. We must *plan* recruitment, based on long-range needs to maintain our work force at its required strength.

Next, from the day the new employee enters on duty, his *development* must be initiated and pursued to the extent needed for him and the Service to realize the greatest possible dividends from his talents and abilities. We cannot “mass produce” employee development. Each person is an individual in his own right, with differing abilities, interests, and career objectives.

Of course, we provide group training for all new professional and subprofessional employees, for supervisors and managers, for specialists and others. But by far the most development occurs on the job, in the right environment, under good supervisors.

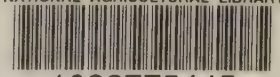
As a new employee advances in the SCS career network, he needs to broaden his horizons and adapt himself to meet new challenges. This can’t be done standing still in the same job or even in the same geographic region.

An employee on the way up welcomes the challenge of rotation or job changes, and, if it comes, the opportunity of attending graduate school at a university in resource development and management.

Finally, our program of developing conservation careers puts great stress on multiple appraisals; that is, evaluation of employees not only by their supervisors but by two or more others who are in a position to know them. This includes not only evaluation of present performance, based on objective observation, but also the best considered judgment as to their potential for the future.

We have been in this business of developing conservation leaders as long as we have been in existence as an agency. Our present and long-time professional standing, both nationally and internationally, reflects what has been done in the past. But new challenges keep looming ahead. Let’s make our conservation career program even more productive in the future.

—D. A. WILLIAMS



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Districts Train Children in the Conservation Way

IN the Eastern and Western Grand Forks counties soil conservation districts, N. Dak., training a child in the conservation way begins not later than the seventh and eighth grades.

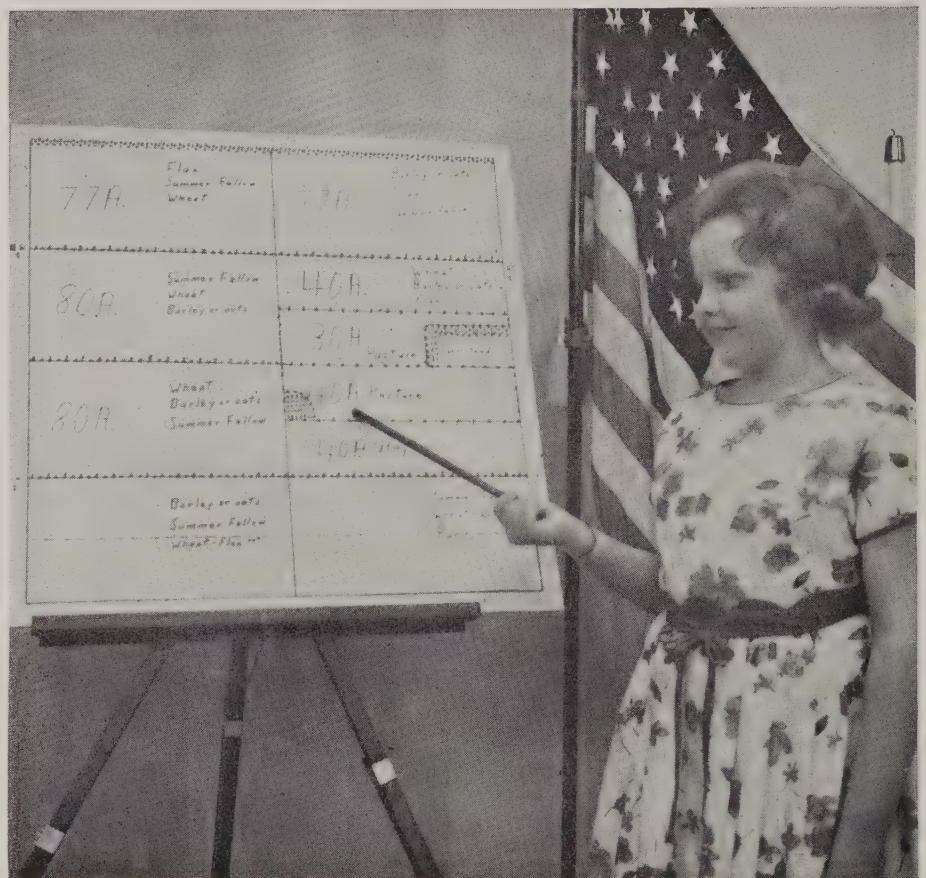
In 14 years, 1,024 seventh and eighth graders have learned about the soil and its relationship to the welfare of society.

The supervisors of the conservation districts are, of course, in the thick of it. Working with them are the county superintendent of schools, the Grand Forks County Bankers Association, the newspapers, the radio and television stations of the county, and the Soil Conservation Service.

An unusual and popular feature of the program is the development of conservation farm plans by the students. And there are exhibits, scrapbooks, posters, illustrated lectures, essays, speeches, and conservation jingles. The county's banks provide prizes for the best efforts in each category.

These special projects supplement the classroom use of a special text, "The Conservation of Natural Resources of North Dakota," in carrying out the State curriculum requirement that conservation be taught in all public schools.

Visits, too, are made to headquarters of the county agent and



Evelyn Lommen of Rye School was a winner in the 1964 illustrated lecture competition, using a farm plan she prepared as a class exercise.

SCS. At school, soil conservationists come to talk and show pictures.

The investment pays off in many ways, the supervisors say. One is in the inevitable effect on the farm family. When the youngsters be-

gin asking questions about conservation on the farm, Dad and Mom are sure to take a closer look at their own farm plans.—M. C. LUND, Soil Conservationist, SCS, Grand Forks, N. Dak. ♦

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Soil Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES



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SOIL
CONSERVATION
SERVICE

U. S. DEPARTMENT
OF AGRICULTURE



Erosion . . .

Watershed project plans and river basin studies continue to pinpoint critical areas of active erosion that must be healed to protect valley lands and waters from sediment damage.

These problem areas are concrete examples of "the unfinished job" of conservation described so eloquently by retiring Deputy Administrator Dykes (June *Soil Conservation*) and defined by Conservation Needs Inventory statistics.

As a followup of that challenge, our lead article this month (p. 51) reexamines the erosion problem in the region that brought forth the conservation movement.

Information Specialist Sellers Archer interviewed our staff specialists at the Ft. Worth Regional Technical Service Center and dug into watershed and river basin reports to give us an up-to-date appraisal of the erosion problem in the South.

Success: New economic life has rewarded communities that met widespread erosion with wise adjustments in land use and thorough conservation treatment. John Cross' story of the Dorcheat Soil and Water Conservation District, La., (p. 60) shows what can be (and in many places has been) done.

COVER: An Arkansas miss points out a tree in the Lafayette County Soil and Water Conservation District chosen for cutting by use of the woodland information stick for southern pines.

Soil Conservation

Devoted to the wise use of land and water resources

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Gullied area in the Caney Creek watershed in Arkansas was smoothed and soded to bermudagrass.



RAMPANT gully erosion in the Southeast was in the spotlight 30 years ago as the Nation awoke to the menace of soil erosion.

The worst of the big gullies have been contained, if not stabilized, and the conservation movement they set in motion has made substantial progress in controlling the associated sheet erosion and soil depletion caused by then prevailing land practices.

A reappraisal of that early arena of soil conservation shows much done but more still to be done. The Conservation Needs Inventory reveals that in the South, as elsewhere in the Nation, roughly two-thirds of the cropland susceptible to erosion still needs conservation treatment.

The acreage of cropland in that region has declined, however, in response to conservation efforts coupled with economic and technological pressures. As a result, in the 14 States from Virginia to Texas the percentage of remaining cropland still needing treatment for erosion control is less than the national average—43 percent compared to 49.

The unfinished job . . .

Erosion in the South

Critical areas still a challenge in early arena of conservation

The area, of course, contains extensive acreages of low-lying coastal plain where excess water, rather than erosion hazard, is the major conservation problem. The 50 million acres of cropland in those States still inadequately treated for erosion is concentrated in the uplands of the Appalachian, Piedmont, upper Coastal Plain, and other inland sections of the region.

These unstable soils continue to be a major concern of conservationists. It was in such areas that Hugh Bennett first began mapping erosion in Louisa County, Va.; Fairfield County, S. C.; Lauderdale County, Miss.; and elsewhere. His reports, although largely ignored for many years, laid the groundwork for the Soil Conser-

vation Act of 1935.

Providence Cave, a huge gully in Stewart County, Ga., was said to have started from the roof drip from a barn. As it grew it gobbled up the barn, the farmhouse, and several hundred acres of land.

Similar gullies were destroying large areas of the upper Coastal Plain and Piedmont Plateau in Georgia, Alabama, and South Carolina and the loess hills along the lower Mississippi River.

The menacing spectacle of these cancers on the landscape, coupled with clouds of dust from the Great Plains, gave impetus to the movement that saw the activation of soil conservation districts throughout the Nation in the late Thirties and early Forties.

Ten of the 14 States referred to above are now completely covered by soil conservation districts. Only a handful of counties, mostly non-agricultural, scattered through the others remains outside organized districts.

To grass and trees

The conservation drive, aided by economic forces, moved clean-tilled row crops off the more erosion-prone hillsides of the South. Much of the crops was replaced by grass and trees, and the rest concentrated on soils better suited to cultivation.

Cotton plantings in the South Carolina-Georgia part of the the Piedmont dropped from 2,340,000 acres in 1930 to 534,000 acres in 1955. Landowners made similar reductions in corn acreage.

By 1955 they had devoted three-fourths of all their land to nontilled crops and miscellaneous uses; nearly 95 percent of their cotton and corn was planted on land classes I to III, the best for cropland.

All across the South the story is the same. There are now about one-third as many acres of cotton and one-fourth as much corn as in 1930—and it is generally concentrated on the less erodible land.

By the end of fiscal year 1964, landowners in the 14 States had planted 29.3 million acres of new pasture and hay land and 1.8 million acres of range. They were using 4 million acres of grass and legumes in rotation.

Trees had been planted to establish 8.3 million acres of woodland.

On the land remaining in cultivation, conservation cropping systems were used on 41 million acres, contour farming on 20 million, cover and green manure crops on 13.8 million, and crop residue management on 36.8 million.

Farmers had built 792,500 miles of terraces and 201.7 million feet of diversions and had established 615,000 acres of grassed waterways.

"If erosion is not the immediate and critical danger now that it was when Hugh Bennett and his colleagues aroused the public to its menace, it is because a good start has been made—not because the problem is solved," says H. B. Martin, Administrator's Field Representative for the South. "The tremendous job that has been done is worthy of the acclaim it has received. But success has tended to make us overlook the fact that our accomplishments are just a beginning on a Herculean task.

Just a beginning

"There are serious erosion conditions remaining to be corrected, and vigilant effort is needed to keep susceptible soils effectively protected after the basic treatments are applied."

What, then, of the problems pointed out by early soil conservationists?

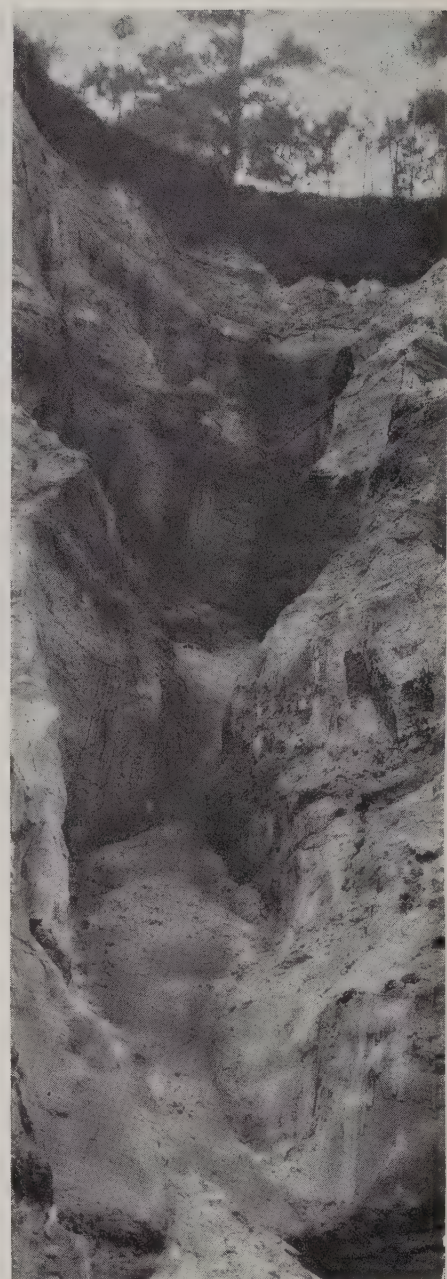
Gully erosion is adequately controlled only in its less severe forms. Its stirrings, like those of a sleeping giant, must be constantly watched.

Georgia's Providence Cave area is now a tourist attraction advertised as the "Little Grand Canyon." It, like others of the more spectacular examples, is a consequence of soil and geologic conditions that make its control impractical. Such mammoth gullies can only be isolated by withdrawal of intensive land use and diversion of water, leaving them as permanent features of the landscape while nature works its slow healing process.

Progress on critical areas

In other areas, more progress has been made in correcting critical erosion conditions. The upper reaches of the Yazoo and Little Tallahatchie watersheds in Mississippi are an example. There gully and sheet erosion long ago had dissected the landscape and crippled agriculture.

Solon Robinson, a pioneer conservationist who visited the area



An active section at the head of the Providence Cave gully is justly billed as "Little Grand Canyon."

more than a hundred years ago, wrote of it as "the land of gullies." Corrective treatment was started there in 1946 in 2 of the first 11 congressionally authorized flood prevention projects.

Today, two-thirds of the 726,000 acres of critical areas are protected with grass and trees. Landowners have planted another 192,000 acres to trees and 322,000 acres to grass



In the Thirties sheet erosion was widespread on the sloping uplands of the Coastal Plain.

—about half the needs in each category. Nearly 18,000 stabilization and sediment control dams were needed, and 84 percent are built. One-third of the 4,500 acres of eroding roadbanks are treated. For other needed practices, the percentages completed drop sharply. More than half of the total job remains after 19 years of work.

“Time, and lots of it, will be needed for steep banks to slough to a stable grade, and for vigorous vegetation to tie down the soil,” says Mississippi State Conservationist W. L. Heard. “Then long-continued watch-care will be needed to prevent fire, overcutting of woodlands, overuse of pastures, and other hazards from destroying the protective cover. A very high degree of maintenance will be required.” So goes the story of gully control work.

Not far away a less severe gully problem on Brackins Mill Creek watershed in Alabama has been solved by the use of diversions, drop structures, and other controls. But in the Southeast there remain many complexes of gullies for which treatment by individual landowners is not feasible and where watershed treatment cannot

be economically justified under present standards.

Contrary to the prediction of a writer during the early days of the soil conservation movement, the land didn’t “heal” when landowners drastically reduced the planting of corn and cotton on unprotected hillsides. Sheet erosion continues apace on much of the South’s sloping cropland. On much of it adequate conservation measures have not been established, or have not been maintained.



A study reported in 1957 of 54 watersheds in Texas, ranging from 64 acres to 332 square miles in size, showed that sheet erosion was responsible for more than 90 percent of the total soil loss on 41, and more than half the loss on all but 4.

It caused 75 percent or more of the soil loss on 7 of 11 watersheds studied in Oklahoma.

In Mississippi, even with its acute problem of gully erosion, sheet erosion caused 50 to 75 percent of the soil loss in 5 of 19 watersheds studied, and 25 to 50 percent in 6.

The extent of sheet erosion in most of the South is between the ranges found in Texas and Mississippi.

Sediment source figures developed by the U. S. Study Commission, Southeast River Basins, show that the gross erosion in the 1,000-square-mile Blue Ridge province is 2,500 tons per square mile annually with 85 percent of it from sheet erosion. Small samplings on the Coastal Plain showed 1,200 tons of soil lost per square mile, with almost all of it due to sheet erosion.

Today improved pasture has replaced much of the clean-tilled crops and a thriving dairy and livestock industry has developed in the South.



Secondary roads are beginning to get the attention they need to prevent erosion. Here bermudagrass is being seeded on the shoulders.

The project work plan of the Big Slough watershed in Arkansas records that sheet erosion removes an average of 8 tons of soil per acre per year from the deep loess soils of Crowley's Ridge—enough to fill a train of 50-ton freight cars 42 miles long.

Sheet erosion from Blackland Prairie soils of the Donahoe Creek watershed in east central Texas amounts to about 11 tons per acre per year.

Two-thirds of the topsoil has

Sterile outwash from eroding uplands spreads over rich bottom land compounding the cost of land abuse.



washed from 41,000 acres of land in classes III to VII, and much sheet erosion has damaged 26,000 acres of class II land, in the South Fork of Broad River watershed in Georgia.

So the story goes as conservationists examine conditions today in specific watersheds and river basin studies. Such reports, of course, give attention to the more pressing problem areas, but they are realistic samples of the job remaining to be done.

Roadside problems

As farmers make progress in correcting land use and curbing erosion on agricultural land, new problems associated with the urban

and industrial development of the South figure larger in the conservation job.

Erosion on newly constructed major highways, with their deep cuts and high fills on wide rights-of-way, is often as spectacular as gully erosion. For that reason, the public has demanded that erosion control be made a basic part of highway development.

First highway erosion control work in Mississippi was started on the Yazoo-Little Tallahatchie flood prevention project. Now the State Highway Department employs two agronomists to plan and promote such work. Plans and contracts for Federal and State highway construction throughout the South now generally include provisions for roadside stabilization.

On older highways and secondary roads, however, conservation has not been so widely adopted. But eroding roadsides are being classified as critical areas in watershed projects, and special attention is given to their treatment in project areas.

Georgia reports that 16,000 miles of its roadsides need stabilization. A study by the Agricultural Research Service there showed that as much as 359 tons of soil can erode from 1 acre of unprotected roadbanks in a year.

The Southeastern River Basin
(Continued on p. 68)

BD. FT. PER TREE										TREE										SCALE										WOODLAND INFORMATION STICK									
1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	6	6 1/4	6 1/2	6 3/4	7	7 1/4	7 1/2	7 3/4	8	8 1/4	8 1/2	8 3/4	9	9 1/4	9 1/2	9 3/4	10
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390	400
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390	400

SOIL conservationists in the Midwestern and Northeastern States are using a new conservation planning tool—a “woodland information stick.”

The idea of a woodland information stick is not new. Several years ago Homer C. Mitchell, SCS woodland conservationist in the Southern States (now retired), developed a southern pine information stick as a planning tool for use by the Soil Conservation Service. It found such wide acceptance that it is now available from commercial sources. In 1964, a comparable tool was developed for the same purpose for use in the Midwest and Northeast.

SCS woodland conservationists worked with foresters of the Central States Forest Experiment Station in adapting research data to practical field problems of rating stocking of woodlands in the region. Applicable simplified data were needed in a readily available form.

We developed the information stick through a series of “approximations,” which were field-tested, then revised on the basis of experience. For the first model, we hand-drafted scales and tables on paper, which we glued to a stick and coated with varnish for protection from the weather.

Finally, in June 1964 the fourth

Woodland Information Stick

Conservationists devise planning tool for ready answers in northeastern woods

By William J. Lloyd

Woodland Conservationist, Regional Technical Service Center, SCS, Upper Darby, Pa.

version was produced. This model was manufactured for the SCS by a commercial firm. All of the field woodland conservationists of the Cornbelt States, as well as many other people, helped in the developmental work. The two woodland conservationists who deserve most credit for this “cut and fit” stage are Robert E. Hartung, Columbia, Mo., and Robert E. Greenlaw, Madison, Wis.

The stick is made of maple, 25 inches long, 1 3/4 inches wide, and 5/16 inch thick. It carries printing on all four sides. In effect, it is a notebook on a stick, a compendium of useful information, combined with scales for measuring the heights and diameters of trees.

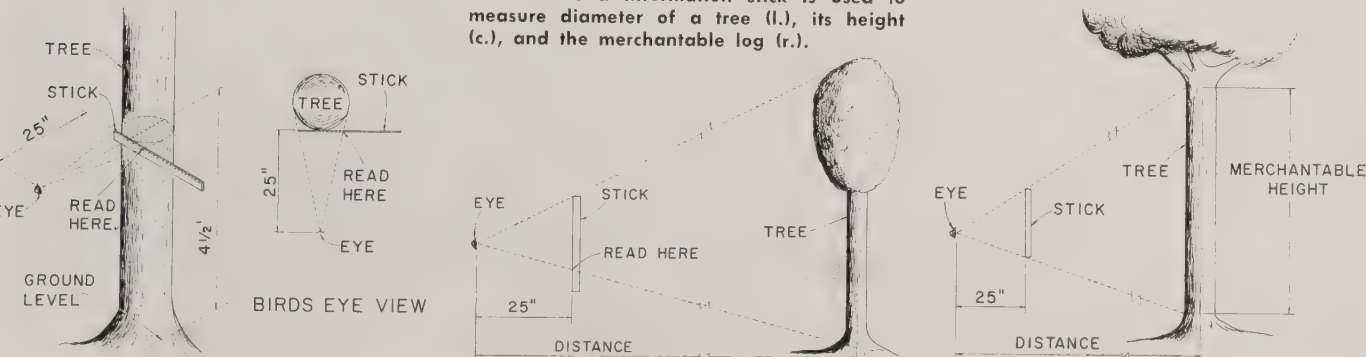
The stick does two kinds of jobs: (1) It furnishes ready answers to many of the questions that naturally arise when a soil conservationist is working in the woods with a landowner; and (2) it supplies information needed dur-

ing the conservation planning process.

Although the soil conservationist usually does not have professional forestry training, with the information stick he has the answers to many common questions at his fingertips, literally and figuratively. Such questions as these can be answered quickly and accurately enough for general conservation planning purposes: How big is that tree? How tall is it? How many board feet in a tree like that? How tall will the trees in this plantation be in another 20 years? How many trees this size would make a cord of wood? How much heavier is hickory than white pine?

In the woods without the information stick and adequate training in its use, the average soil conservationist could have that sinking feeling—the kind that shows up when you are in a no-trump bridge contract and discover that

The woodland information stick is used to measure diameter of a tree (l.), its height (c.), and the merchantable log (r.).



you have a suit without a stopper.

We developed the woodland information stick primarily as a land use planning tool; not as a final guide to silvicultural plans. It is useful in assembling the basic information to help the landowner arrive at planning decisions.

For example, several of the crop-tending practices (thinning, weeding, intermediate cutting) are applicable only when there are

more trees present than are needed to fully stock the area; that is, to use all the growing space. A procedure has been worked out for simple measurement of the stocking by the soil conservationist and the landowner working together.

The information stick carries stocking guides; it lists by diameter classes the trees needed to get best growth. This, then, is the measuring stick against which the

findings can be evaluated. Since the landowner sees for himself what the stocking is, it is easier for him to understand more fully why certain practices are needed or could be used.

The woodland information stick is now in use in most of the Midwestern and in several of the Northeastern States. We plan to introduce it into the other Northeastern States next year. ♦

A town that's going to the birds . . .

Barrington Residents Beckon To Purple Martin Families

By William J. Melven and Elmer E. Offerman

Field Biologist and Work Unit Conservationist, SCS, Champaign and Lake Zurich, Ill.

BARRINGTON, Ill., is making a strong bid for recognition as the purple martin capital of North America.

Success achieved last year in attracting purple martins into northern Cook County suggests that Barrington residents may accomplish their goal easily.

Sparking the effort are two active conservation organizations—North Cook County Soil and Water Conservation District and the Barrington Conservation Council. Newspapers, radio, banks, grocery stores, all have participated.

And a Chicago daily newspaper carried an article on the purple martin program suggesting purchase of a martin house as a Christmas present for the man who has everything. In the following days the Barrington Conservation Council was surprised with a flood of telephone calls and letters requesting information. The Christmas campaign netted 125 sales.

The continuing promotion includes some unusual twists. One was a newspaper advertisement in the "Too Late to Classify" section of the Barrington Press:

"New 12-unit multiple dwellings for sale. Erect on your property in 1 hour. Meets all zoning and building requirements for purple martin families. Years of enjoyment as return on investment. 12-unit apartment, \$29.95, 14 ft. mount, \$13.95."

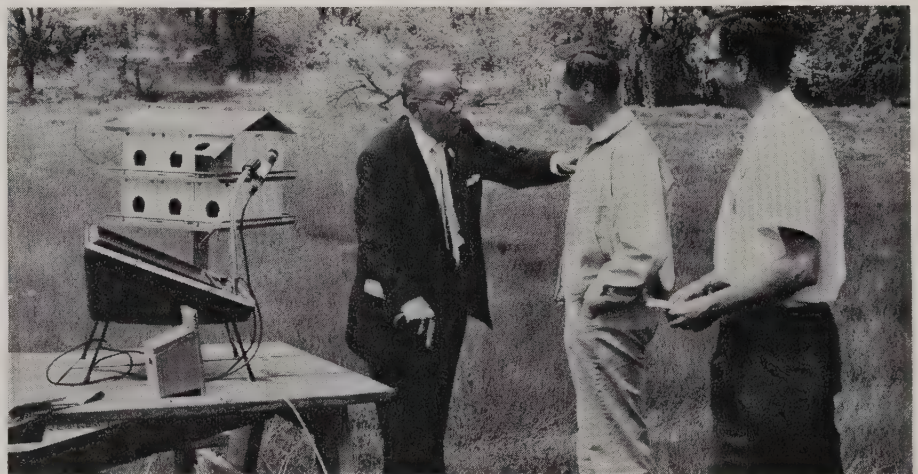
A field-day program featuring demonstrations and talks by conservationists attracted 150 people. One program participant, Dr. T. E. Musselman, author-lecturer on migratory wild birds, stressed benefits of having the martins. They are a natural means of insect control.

Cooperating in the campaign was a manufacturer of martin houses. The company entered an agreement permitting the conservation council to sell its products and use the profit for other conservation projects.

Barrington Mayor John Blanke accepted the first martin house from SWDC Directors Richard Krause and Frank Wollney. The house was erected on village property.

Krause said 80 houses were sold last year providing homes for more than 300 martin families. It was estimated there was 80 percent occupancy.

The purple martin campaign may be aimed at control of insects for the benefit of man, but an increase in the purple martin population indicates that the effort also is for the birds. ♦



Dr. T. E. Musselman (l.) presents purple martin house to Roland Eisenbeis of the Forest Preserve District of Cook County. Looking on is Frank Wollney, North Cook County Soil and Water Conservation District chairman.

"Blue Gold" Is New Harvest From New Hampshire Highland Woods

By David A. Bennett

Soil Conservation Aid, SCS, Rochester, N. H.

NEW HAMPSHIRE farmers, summer residents, and others are using usually unproductive, upland areas for raking in blueberry dollars.

The rapidly growing enterprise opens up a new, profitable use for rough, stony highlands so abundant in this part of New Hampshire.

In the past, unimproved land was suited only for woodland and wildlife uses. Now, blueberry harvests exceed 400 tons annually. Bulk sales bring between 12 and 19 cents a pound with top production at 2 tons an acre.

The lowbush blueberry plant is native to a large part of New Hampshire. For years it was undisturbed beneath a canopy of trees. Early settlers discovered that it could be stimulated into a profitable cash crop. Cutting trees and controlled burning of wild blueberry areas bring the sleeping plant to life. A season later, it swings into fruit production.

Scientific management keeps the soils of these areas in profitable use. Periodic pruning of old plants is important.

Soil conservation-minded Maurice Hayes of Milton, in southern New Hampshire, has developed a portable oil-fired burner to do his pruning job without loss of valuable ground litter. He has helped many growers build their own burning equipment.

Unlike wild fire, the oil burner

gives complete control of the degree of burn. The hot fire sears off the old plants and leaves the organic layer intact. An acre of land can be pruned in 2 to 4 man-hours, using 50 to 60 gallons of oil. Conventional burning takes 8 to 10 man-hours an acre.

Irrigation is also being used by some growers to insure a bountiful and high quality harvest. Equipment costs are quickly recovered during droughty seasons. Many hillside ponds have been constructed to store water.

Harold Sanborn of New Durham feels that irrigation is a must, even during periods of normal rainfall. He finds the application of a small amount of water a few days before harvest can increase returns as much as 20 percent. Chemicals for insect and brush control also help growers produce a fruit superior to the era of "let's-get-a-pail-and-go-berrying." ♦



Maurice Hayes uses a high-pressure oil burner of his own design (above) to prune lowbush blueberries without destroying organic matter on the ground. A small amount of irrigation water applied just before harvest (below) increases the yield of blueberries. SCS Technician Richard Hebbard (l.) discusses a sprinkler system with Hayes.

Arkansas Youth Corps Aids Soil and Water Conservation

THE energy and enthusiasm of 235 young people gave soil and water conservation in Arkansas a boost for 12 weeks last summer.

They were enrolled in a Neighborhood Youth Corps Program sponsored by the Arkansas Soil and Water Conservation Commission. The conservation districts provided local leadership and employed the youths who helped plan and install conservation practices. The Soil Conservation Service provided job supervision, onsite training, and transportation.

District boards selected enrollees from applicants declared eligible for the program by the State Employment Security Division.

Enrollees were paid \$1.25 an



Youth Corps enrollees assist an SCS technician check out a farm pond.



Sterlin Hurley, president of the Arkansas Association of Soil and Water Conservation Districts, counsels with Neighborhood Youth Corps enrollees on banking procedures.



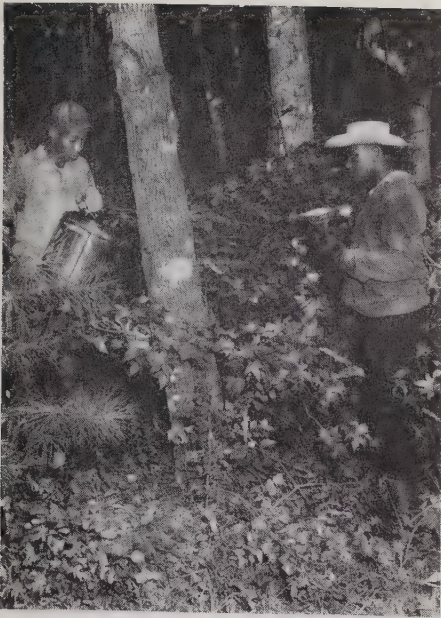
hour. The Office of Economic Opportunity assumed about 82 percent of the total expense of the program, and the districts 18 percent through supervision, supplies, equipment, and office space.

Jobs performed by the NYC enrollees included drafting maps and charts, updating records, helping maintain district-owned equipment and structures in watershed projects, assisting with field engineering and timber stand improvement, taking soil samples, and performing clerical duties.

Sixty-five districts participated in the program and district boards were highly pleased with the results, according to Sterlin Hurley, president of the Arkansas Association of Soil and Water Conservation Districts.

"The youngsters were quite helpful," William B. Davey, SCS

SCS work unit conservationist (I.) instructs Youth Corps member how to measure aerial photographs.



Youth Corps workers do timber stand improvement work on school-owned land near Prescott, Ark.

State conservationist, said. "We believe that the work experience planted some seeds that will grow future conservationists." ♦

1,100 Youths Hold Conservation Jobs

More than 1,000 youths in 15 States were employed in soil and water conservation work last summer under the Neighborhood Youth Corps Program. An additional 24 college students received work experience in fields associated with the informal educational pursuits through Work Study Programs in 4 States.

Most of the NYC youths were employed in Arkansas (235), Colorado (190), North Dakota (158), Minnesota (130), Nebraska (84), Missouri (59), and Oklahoma (48). The youths worked in more than 400 soil conservation districts.

The NYC conservation projects were sponsored by State Soil and Water Conservation Committees, State Departments of Conservation, the Farmers Union, and other organizations. These young people worked in soil conservation dis-

tricts and were assigned to SCS technical personnel who provided training and supervision.

The college students enrolled in Work Study Programs included engineers, journalists, law stu-

dents, soil scientists, and soil conservationists. They were employed in soil conservation district offices and on watershed parties. SCS technical personnel provided the supervision and guidance. ♦

Conservation District Gives On-Job Training for Students

By Elmer E. Jones

Work Unit Conservationist, SCS, Athens, Tenn.

A PROGRAM of on-the-job training is providing opportunities for McMinn County, Tenn., vocational agriculture students interested in conservation to develop needed skills before leaving high school.

The program was devised by school Principal B. E. Childers, now State director of Vocational Education for Tennessee, working with Rex Moses, chairman of the McMinn County Soil Conservation District; Boyd Trew, Vo-Ag instructor; employees of the Soil Conservation Service; and representatives of agriculture-related businesses and industries.

The new program gives senior vo-ag students an opportunity to work in agriculture-related jobs in the afternoon after attending school in the forenoon. The student receives school credit for his participation and such pay as the cooperating employer arranges.

The McMinn District is one of the cooperating employers. It entered into an agreement with the county school authorities to coordinate the student's training activities. The district also entered into an agreement with the SCS under which SCS gives the student guidance as he gains experience in the district's work.

Kelly Shepherd, Jr., now a student at Tennessee Wesleyan College, Athens, was the first high school conservation trainee. Chairman Moses of the conservation district secured funds from the McMinn County Council (county gov-

erning body) to pay him 75 cents an hour for his training work.

Shepherd learned how to use and care for survey rods and dumpy levels; to keep survey field notes; to lay out and check construction of ponds, terraces, diversions, and drainage ditches; to read and interpret aerial photographs; to interpret soil maps; and to ink and draft farm conservation plan maps. He was instructed in eradicating rough fish from farm ponds, in woodland improvement, tree planting, and taking soil samples.

By the end of 1964, two other students had indicated interest in soil and water conservation job training. Ronald G. Price was selected as the trainee for 1964-65.

Funds to continue the program have been provided in the McMinn County budget. ♦

Roy R. Dennis, soil conservation technician, gives Ronald G. Price a little help with his field notes.



Pines, Pastures, and Ponds Bring New Economic Life

By John M. Cross

Assistant to State Conservationist, SCS, Alexandria, La.

SOMEBODY told people in Webster Parish, La., that their economy was no longer based on agriculture, and many believed it.

Except, of course, the people who knew better.

Even a private research concern, which had made a study, so reported. But Don Hinton, chairman of the Board of Supervisors of the Dorcheat Soil and Water Conservation District, just couldn't buy it. And he has proved his point.

He asked Fermont Hofmeister, SCS work unit conservationist; James K. Gladney, county agent; and Miss Kate Crownover, ASCS county office manager, to get some facts and figures together. In just a few hours they surprised even themselves with what they found.

Cotton, crabgrass, and calamity had made scenes like this all too common in Webster Parish 30 years ago.



This was the birthplace of conservation in Louisiana. In the days of the old Brushy-Cooley Demonstration Project there were 37,310 acres of cotton in the parish. In 1964, there were 2,210 acres.

What do you do when 35,000 acres of cotton disappear from a community? Where are the people who grew, harvested, and processed the crop? How do you replace the income that cotton brought in? Hofmeister and his fellow workers can tell you.

There wasn't enough beef sold in Webster Parish in 1934 to be reported. In 1960, the income from beef was \$400,000. In 1963, it was \$920,000. That's what happened to part of the cotton land—it went back to grass.

Because of the depletion of the land, yields of cotton were so low and profit so little that change was imminent. Since the Dorcheat dis-



Trees are a multi-million dollar industry in Webster Parish today, thanks to the district's tree-planting program.





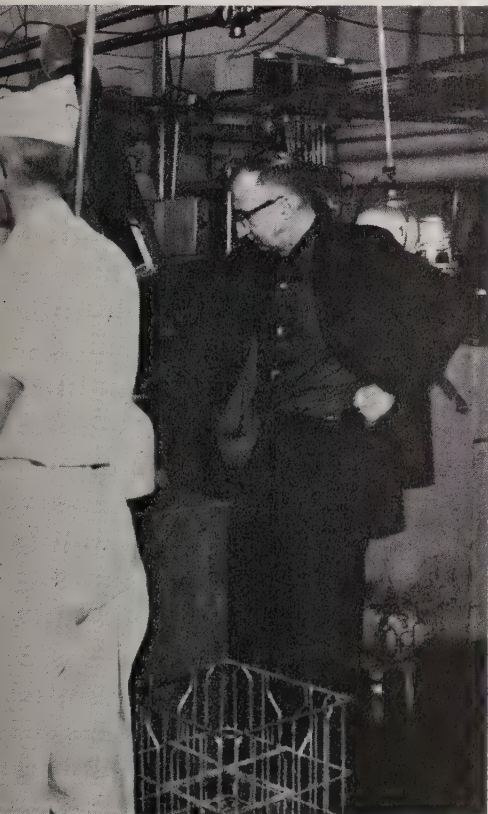
taxes. The money they spend keeps moving in the economy.

A large paper mill employs 1,950 people. It eats up 2,200 cords of pulpwood a day. If you go out where they are harvesting the wood, you'll find some more of that lost cotton land. Trees planted by CCC boys in the Thirties now are being harvested to make the bags that today's workers take their groceries home in.

There is a good chance that some of the trees were planted with a planter owned and operated by the conservation district, and the planter was probably manufactured in Minden, county seat of Webster Parish. A local farm machinery manufacturer got into the business when tree planting was at its peak and is still making rotary mowers, hay rakes, and mulch tillage implements. Two such plants sell \$41¼ million worth of these tools each year, made by 145 local people who send their children to school, buy drugs downtown, go to the movies occasionally, and support local businesses in a lot of other ways. Are they not "based on agriculture?"

The largest of 4 lumber mills in Webster Parish hires 292 local people.

Milk is harvested twice a day from grasslands under conservation treatment in Webster Parish.



trict was chartered in 1938 the change has been steady but firm. What started out to be an emergency measure to stop erosion has become a major source of income.

In 1934, there were no packing plants in the area. Now there are 3. They employ 165 people and do a \$6½ million business each year. These 165 people own homes, support their churches, trade at the neighborhood groceries, and pay

Beef has replaced cotton on part of the 35,000 acres shifted out of row crops in the conservation program.



ple, and last year sold 30 million board feet of lumber for nearly \$3 million. In addition, it sold a quarter million dollars worth of chips, pulpwood, and charcoal wood. The owners are staunch supporters of the conservation program for a very good reason—it puts bread and butter on the table for them and their employees. And the people who work at the mills go to the doctor when they need to, hire a lawyer if they need one, and build houses with their own product on lots bought from a realtor.

Don Hinton sells milk to a processing plant in Minden. Last year he and his neighbors sold a half million dollars worth. The plant employs 56 people who process and deliver the product of the land every day. And these 56 people buy gasoline and tires, clothes and shoes—must we keep repeating?

It's all agribusiness

Hofmeister and company found out that of the total money paid in wages to citizens of Webster Parish in 1964, nearly half of it, 44½ percent, went to people who harvest, process, or sell the fruits of conservation farming! Add that to the income of farmers growing the product, plus the amount of business enjoyed by retailers and others that is traceable to agribusiness, and you find, as Don Hinton did that the economy of the parish is based *directly* on agriculture.

When the pattern of land use changed from cotton, crabgrass, and calamity to pines, pastures, and ponds, these people slowed down only long enough to shift into a higher gear. Farm population decreased 43 percent during the transition, but total population increased 6 percent.

People left the land, perhaps, but they just moved a few miles away into town. Now they harvest their crops with an axe, a power saw, a mowing machine, or just let their livestock do it for them. They have a recipe for rural economic development based on the soundest

foundation in the world—the conservation and development of natural resources.

Hinton and his helpers are spreading the story. They have put together a slide-illustrated program using local photos of people well known in the parish. It has been presented to civic clubs,

and there is a waiting list of organizations that have asked for it. The district supervisors have published a four-fold brochure telling the story in pictures. They talk to people where their hearing is best—through the pocketbook—and tell them that the economy of their area *is* based on agriculture. ♦

Cathedral Pines Recreation Area Is Memorial to Joint Action

By Manley H. Bailey

Work Unit Conservationist, SCS, Farmington, Maine

(Picture on p. 72)

THE joint efforts of many people and organizations are responsible for the success of the Cathedral Pines recreation area near Stratton, Maine.

The 300-acre area covered with Norway pines ranging from 50 to 100 feet high borders Flagstaff Lake, only a 3-hour drive from the City of Portland.

In 1963, the Stratton-Eustis Development Corporation was formed as a nonprofit organization to improve the economy of the Stratton area. As cooperators with the Franklin County Soil Conservation District, the corporation had the use of a soil survey and other technical assistance of the Soil Conservation Service in planning the stately stand of Norway pines as a peaceful spot for vacationists.

The proposal called for the development of 80 tenting sites, 20 travel trailer accommodations, and necessary facilities for a destination-type camp ground. Day picnicking will continue to be available to local people.

Financial assistance for the recreational development was provided by the Farmers Home Administration. Other State and local agencies contributed also to the development of the plan.

The corporation is well on the way in establishing its plan. Besides the campsites, the vacationist will find a bathing beach, fishing

water, a playground, and recreational hall. Nature trails are being established leading to a natural wildlife marsh where beaver activity can be seen.

The area has been in semipublic and public ownership for more than a century and a half. It was part of an 1807 grant by the Commonwealth of Massachusetts to the Trustees of Bath Academy. Ownership became vested in the town of Eustis in 1871, after which the area was commonly known as the "public lots."

About the turn of the century, Agnes Meader and Kate Ricker built a small camp and lunch room at Cold Spring, adjacent to the public lots. They are credited with having first named the area "Cathedral Pines."

The site is on the route of Benedict Arnold's ill-fated expedition to Quebec in 1775. With a greatly diminished band of men, he reached the area on October 19. A week later, after having lost several boat loads of provisions in the North Branch of the Dead River, the expedition started down the Chandiere River to Quebec.

Today, the strife and misery of 1775 are replaced by peace and contentment. The tourist and camper approach the towering Norway pines with the feeling that "This is a place for us to forget the noise of the city—a good place to get away from it all! ♦

Texas Community Gets Economic Lift From Pole Processing Plant

By Ted H. Elders

Work Unit Conservationist, SCS, Linden, Tex.

A POLE and timber processing plant at Linden, Tex., has brought economic benefit to the whole Marion-Cass Soil Conservation District, and especially to tree farmers.

Sixteen people have full time employment at the plant. More than double that number are busy cutting and hauling timber from the woods.

Landowners are making a profit from trees on land that failed to pay with corn, cotton, and "taters."

Posts are available for fences in the expanding improved pasture the market for timber, a source of program now under way. Besides building materials is readily available for landowners, business, and industry.

Source of raw materials

The timber treating plant is the brainchild of N. L. Evans who saw development of tree plantations in east Texas as an unending source of raw materials for such an enterprise.

The tree plantations were the outgrowth of a conservation needs survey undertaken by the Marion-Cass District Board of Supervisors in 1948. They found there were 250,000 acres of land in the district too steep and eroded for anything but trees.

Located in the rolling, sandy hill country where Louisiana, Arkansas and Texas join, the area is noted for its many lakes and fine fishing.

Years ago many of the hills were denuded to make way for cotton, corn, and potatoes. At one time there were over 40,000 acres of cotton in the district. Continued row cropping and heavy rains led

to abandonment of many fields long before the district was organized in 1943.

A job of restoration

It was observed by Dr. Joe D. Nichols, one of the newly elected supervisors, that there was a job of restoration in the district rather than preservation, for there was little left to preserve.

After the survey was completed, Federal and State agencies, industrial and business concerns, civic clubs and individuals were asked to assist the district with their plans.

A tree-planting program was decided upon and everyone set out to sell pine trees. The first year 400,000 trees were planted. In 1958-59, more than 11 million trees were sold and planted.

Plantations of different sizes and ages were scattered throughout the district, and by 1961 the earliest ones were ready to thin.

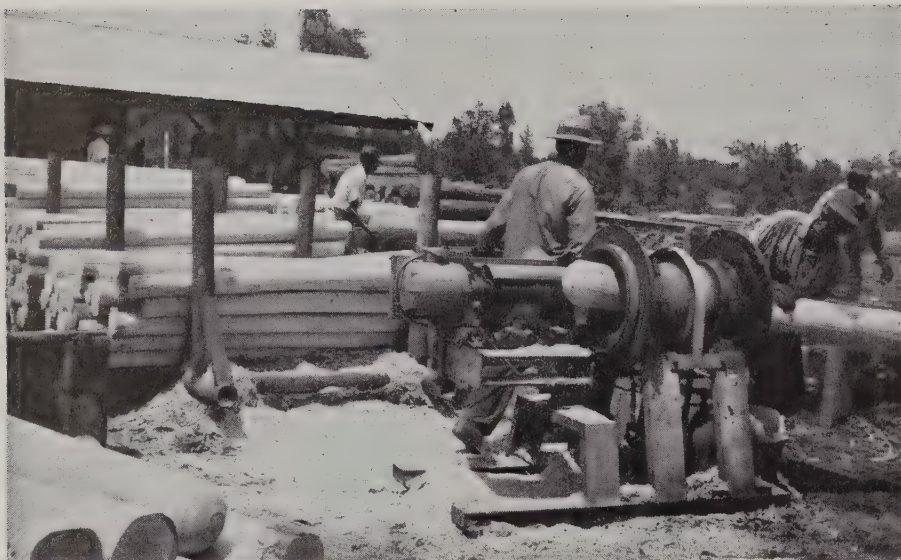
It was at this point that Evans made his move. Since most of the people in the district were practicing conservation and thinning their timber selectively, a treating plant could be assured of raw products year after year.

A modern plant

Evans decided to build a plant modern in every way that could fill orders to meet the most strict specifications. It has been in operation since 1962 and treats about 1 million board feet of lumber and

Between 1958-59 about 11 million pine trees (above) were planted on different size plantations in the district. By 1961 the first planted plantations were ready to thin (below). Cuttings were used for poles and posts.





Employment is up in the district with 16 in-plant workers and twice as many busy at cutting and hauling timber from the woods.

more than 200,000 cubic feet of posts and poles a year.

Products have been shipped to Nebraska, Kansas, Arkansas, Louisiana, Indiana, Iowa, Missouri,

Oklahoma, and Texas.

Since Evans first began operation of the plant the area around Linden has been revitalized, both physically and economically. ♦

SCS and BLM Join In Land Planning

BETTER coordination of resource conservation and land development on intermingled public and private lands in Western areas will be the result of a recent agreement between the U. S. Department of Agriculture and the U. S. Department of the Interior.

In the Western States the Bureau of Land Management usually manages the Federal land, while the Soil Conservation Service works with private landowners through soil conservation districts.

Under the agreement, BLM and SCS will combine their methods and techniques and work more closely with local soil conservation districts where public and private lands are intermingled. Areas where these lands are dependent upon one another, as in upper and lower portions of a watershed, will also be affected.

State-level BLM, SCS, and conservation district officials will de-

cide annually which areas will receive special planning during the year. Local officials of the three groups will then develop detailed work plans on a closely coordinated basis.

"The real significance of this agreement," Donald A. Williams, administrator of SCS, and Charles H. Stoddard, director of BLM, said in a joint statement, "is that it will set up step-by-step actions to get broad resource development really going on these mingled public-private lands." ♦

SCS Has Chapter in Legislation Reference

"A major Federal resource objective in the postwar era was to protect and enhance the Nation's soil and water resources by means of soil conservation measures."

So begins the chapter on Soil Conservation and Small Watersheds, dealing with the Soil Conservation Service, in *Congress And The Nation*, an 1,800-page refer-

ence work on government and politics from 1945 to 1964.

Published by Congressional Quarterly Inc., the single volume contains summaries of all major legislation during the 20-year postwar period, including a chronology of legislative action affecting SCS and other conservation agencies and summaries of various SCS and other programs.

The book is mostly for the use of reporters, editorial writers, political scientists, and politicians. ♦

New Research Center For Northern Plains

The Northern Plains Soil and Water Research Center, recently established at Sidney, Mont., will directly serve a 70-million-acre area, primarily in Montana but also extending into Wyoming and the western Dakotas. Specific investigations will be planned to meet the most pressing needs for controlling wind erosion and conserving soil moisture in the area.

The Agricultural Research Service will operate the center, in cooperation with the Montana Agricultural Experiment Station, the Montana soil and water conservation districts, and the Soil Conservation Service. ♦

Appalachia Plant Center Located

The Appalachian Regional Development Program will gain an assist from a plant materials center to be built by the Soil Conservation Service at Quicksand, Ky.

Better plant cover is needed on the steep, shallow, acid soils and those left bare by mining operations throughout the Appalachian region. At the center and on nearby farms, SCS specialists will evaluate a wide variety of plants that can be used to prevent erosion and restore these lands to productive use for pasture, woodland, wildlife, or recreation. ♦

New Grassland in Idaho

Livestock now graze where growers once struggled with wasting soil

"NOTHING else the Government has done has profited the country in this way," says W. Clay Sutton, Midvale rancher.

Sutton is first secretary of the Weiser River Soil Conservation District in west central Idaho.

As he spoke, he swept a hand across the horizon, indicating what he meant by "this."

The valleys and hills in Washington County, Idaho, which make up the landscape, abound now in acres and acres of grassland—hip deep and truckhood high before grazing.

Diversified operation

Diversified livestock-hay-pasture operations are yielding good returns on once abandoned wheatland and overgrazed or burned-over rangeland. Grain acreages are smaller.

"I was a wheat grower when I came here in 1919—that was what I knew," Sutton recalls. "In those days if you were a wheat grower you tried to grow wheat—not what was best to grow in the soil and climate."

Result: Many a farmer went broke trying.

Before the district was formed in 1940, there were 462,754 acres of private land—about 49 percent of the total in the county. This included 60,000 acres of nonirrigated, 21,000 acres of irrigated agricultural land, and 347,025 acres of grazing land.

Soils were susceptible to erosion because of texture, slope, and vegetative cover—or lack of it. Sheet erosion occurred because of improper use of critical slopes. Wild

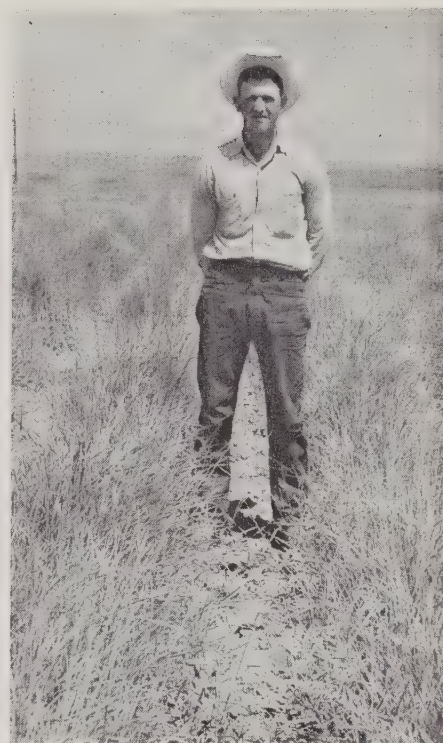
fires, overgrazing, and destruction of good perennials caused erosion on rangelands.

Thus did the first district supervisors appraise the situation as they took a hard look at the future of their country.

Goal and program

The goal: Balanced economic units with grassland and alfalfa hay or pasture, livestock, some grain in rotation, and smaller acreages of cash crops.

The program: Seed adapted legume-grass mixtures for hay and pasture. Regulated grazing on permanent hay and pasture and rangeland. Seed supplemental an-



Dawson Gaertner, another cooperator, in seed plot of pubescent wheatgrass, Midvale area, Weiser River Soil Conservation District.

nual pastures. Trees, shrubs, and vines planted for posts and fuel, and for farm and feedlot shelter-

Fat cattle on first year grazing for intermediate wheatgrass and alfalfa please District Cooperator Bob Stout of Mann's Creek. The land was formerly in wheat production.



belts; channel bank stabilization; erosion control; and wildlife food and cover.

Irrigation systems were adapted to soils, slopes, and crops, and application and use of water controlled.

Although only a handful of the more than 700 farm operators were in on the SCD program at the start, those few provided the demonstration of how effective and profitable grass and livestock in combination can be.

District and the Soil Conserva-

tion Service quickly had support and help from the county agent and from the Weiser Chamber of Commerce in spreading the word. An annual Soil Conservation Day was launched with backing of the Chamber of Commerce and the county agent.

It was conversion of people as well as land. According to Milton W. Branch, chairman of the Idaho State Soil Conservation Commission and former Weiser River SCD supervisor, "Without grass we would have starved out." ♦

SCS Design Helps Irrigation Company Salvage Tunnel

WITH the help of the Dolores Soil Conservation District and some unusual engineering, the Montezuma Valley Irrigation Company in southwest Colorado has licked the troublesome problem of a decaying 76-year old irrigation tunnel.

Built in 1889, the 5,300 foot diversion tunnel brings life-giving water from the Dolores River to irrigate the Montezuma Valley, where more than 35,000 acres of land is devoted to small grain, hay and irrigated pasture. It also serves the domestic and industrial interests of the City of Cortez with its population of 7,500.

The original tunnel was drilled through formations of sandstone, limestone, shale, and coal. By 1950 its condition was beginning to pose a threat of disaster. Little maintenance work had been done through the years and the lower end of the tunnel was eroded badly. Yearly repair and cleaning became a necessity.

Things got critical when the work became extremely hazardous for the maintenance crews. There was also the maintenance cost, which by 1960 was exceeding \$2,000 a year.

On request of the Montezuma Valley Irrigation Company an

investigation was made by Soil Conservation Service engineers assisting the Dolores Soil Conservation District. It revealed that the tunnel was rapidly deteriorating, with water-gouged holes on the floor and eroded roof sections as high as 30 feet. It was discovered also that the tunnel was neither straight nor on uniform grade, a complicating factor in planning repair work.

This view of the outlet end of the tunnel shows ¼ head of water flowing through the straightened and repaired tunnel from the Dolores River.



Initially the SCS designed a tunnel liner with concrete floor and curb with a corrugated steel metal arch liner plate overhead. The estimated cost of this type of installation was \$100 a foot. After further checking, officials of the irrigation company determined that uranium mines in the vicinity were using H-beam arches to support 4 x 6-inch timbers for tunnel lining, and this type of installation could be made for less than half the cost of the metal arch liner.

SCS engineers approved this type of construction and the irrigation company installed the liner in 1,060 feet of the downstream end of the tunnel at a cost of \$38,000. The tunnel was in continual use during the 1964 irrigation season.—HAROLD W. BRADFORD, *Work Unit Conservationist, SCS, Cortez, Colo.* ♦

Many Districts Have Forestry Agreements

More than two-thirds (1,999) of the Nation's soil and water conservation districts were operating last year under memorandums of understanding with State forestry agencies, and almost half (1,371) had verbal agreements with State foresters.

Also last year, 238 districts had formal agreements for mutual cooperation with units of the national forest system administered by the U. S. Forest Service; and 737 national forest units had informal working agreements. Department of the Interior agencies had 122 agreements with districts, with dozens more pending.

These agreements are designed to encourage cooperation in good land management or to aid the districts on forest product marketing problems. ♦

The United States is the world's largest exporter of agricultural commodities, and also one of the world's largest importers of farm products.

Better Management Improves Colorado Highland Meadows



The Spanish Peaks of Huerfano County, Colo., look down on stacks of hay harvested on a section of the county's 35,000 acres of irrigated and improved land.

ON 700,000 acres of mountain meadows, 2,500 Colorado ranchers winter-feed half a million sheep and cattle.

These meadows are usually park-like areas at elevations of 6,500 feet to more than 9,000 feet, surrounded by higher and often rugged terrain.

A general shortage of irrigation water in recent years has influenced stockmen in the region to practice better water management. Many stockmen have installed water-measuring and water-control structures.

Pete Engle, SCS work unit conservationist at Gunnison, estimates that three-fourths of the meadows in his area have had the benefit of improved water management through the influence of soil conservation district efforts.

Meadow improvement through renovation, leveling, and reseeded continues to increase, although this usually does not involve large

acreages. Soil Conservation Service specialists say that hayland management is inclining toward smaller acreages of high-quality, higher-yielding meadows, making it possible for operators to make more efficient use of irrigation water.

In seeding pastures, brome and alfalfa, timothy and alsike clover are the popular mixtures. Intermediate wheatgrass, alta fescue for normal meadows, creeping meadow foxtail and reed canarygrass for wetlands, and tall wheatgrass and alta fescue for salty lands are used in some of the new seedings.

Well over half of the hay yield is being baled now, according to estimates. All kinds of new and improved equipment are being used in the mountain fields—swathers, balers, bale gatherers, and bale stackers. The loose hay stacks have all but vanished. The large hay crews are seldom seen.

All of these changes promise a bright, new era in Colorado's mountain areas, made possible through more efficient resource use and management. —JIM BRUNER, *Conservation Agronomist, SCS, Denver, Colo.* ♦

USDA Notes October As Cooperative Month

Observance of October as "Cooperative Month" will begin with a 5-day program of activities sponsored by the Department of Agriculture Monday, October 4 to 8, in Washington, D. C.

Seminars and movies will emphasize the role of cooperatives in providing high quality consumer goods and services; job opportunities, credit, supply, and technical services for farmers; community leadership; electric power and telephone systems in small towns and rural areas; and a strong foundation for the free enterprise system. ♦

Erosion

(Continued from p. 54)

Study Commission pointed out serious roadside erosion on 27,000 miles of roads, a little more than 20 percent of county, State, and Federal highways in the area, which covers part of Georgia, Alabama, Florida, South Carolina, and North Carolina. "Soil loss is estimated at 3.6 million tons, an average of 133 tons per mile annually," the report said.

In Alabama, the Tombigbee River Basin Study points out the need for erosion control on 4,170 miles of roadbanks.

Every watershed project plan and river basin study recognizes eroding roadsides as sources of sediment and fast runoff, and proposes treatment. And gradually, road authorities at all levels are recognizing the need for treatment in the interest of good road maintenance, traffic safety, and beautification.

Urban building sites

Control of erosion in the South's rapidly growing urban areas is a problem of concern to the urban planner and the conservationist, the farmer and the suburbanite, the health officer and soil scientist, local governments and garden clubs, and to State and Federal agencies.

The Conservation Needs Inventory indicates that 4.6 million acres will go out of agriculture to urban and built-up areas in the South and Southeast by 1975. This foretells an expansion of 28 percent in the urban area of 1958.

Planning and zoning boards, conservationists, and leaders from community to National levels are groping for ways to meet their various objectives without penalizing the interests of developers and home buyers.

The control of erosion of building sites is one of the vexing conservation problems of the day.

Soil torn from the land by gully and sheet erosion or washed from construction and urban sites doesn't just disappear; often it would be better if it did.

The floor of an early day bridge was found 7 feet below the surface by a contractor digging a core trench for a flood detention dam on Rooty Creek watershed in Georgia. Once an adequate stream channel ran below the floor.

Sources of Sediment

The sources of sediment can sometimes be pinpointed. Creeks feeding directly from the bluff hills of Mississippi onto the Yazoo delta bring 7,700 acre-feet of sediment a year. Twenty percent is silt from sheet erosion on fields, nearly 40 percent is sand from deep-cut gullies and roadbanks, and the remainder is fine material from streambank erosion.

Sediment has damaged 15 percent of the 9,200-acre flood plain of the Upper Bayou watershed in Oklahoma. The stream discharges 350,000 cubic yards of sediment from its mouth each year, and 85 percent reaches Lake Texoma. The watershed project now under way is planned to protect 1,100 acres of flood damaged land and reduce the flow of mud to Lake Texoma by more than 200,000 cubic yards annually.

Stewarts-Lovills Creeks watershed on the Virginia-North Carolina boundary line is small but is representative of many in the Blue Ridge-Piedmont area. Nearly one-tenth of its 2,800-acre flood plain is damaged annually by sediment deposition, and another 80,000 tons of sediment reaches the mouth of the watershed each year. Land treatment and watershed structures will reduce land damage to a negligible amount and hold back 65,500 tons of soil now lost from the watershed.

The Mobile County, Ala., Soil Conservation District newsletter reported that a dredge pumped 50,000 cubic yards of sediment each

day for 202 days from the Mobile River channel to maintain harbor traffic.

And these are *continuing* depositions—not soil from a long-ago period when people neglected the land. Obviously, the South still has an unfinished job of erosion control of major proportions. The impressive accomplishments to date are, as Conservationist Martin said, "just the beginning of a Herculean task." ♦

Non-Federal Aid To Conservation

Non-Federal contributions to the design and layout of conservation practices in 1965 added the equivalent of 3,615 man-years of technical services to those provided by the Soil Conservation Service.

The contributed personal services are valued at more than \$25 million. The estimate is based on what it would have cost SCS in additional staff to do the same work.

The non-Federal input to establishment of conservation measures increased approximately 50 percent from 1960 to 1965. The corresponding contribution 5 years ago was 2,357 man-years.

Individual land owners and operators made the largest contribution, 1,723 man-years or approximately half the total. Much of this time was spent directly helping SCS technicians make preliminary engineering surveys, determine need and practicability, stake and layout practices, check practice performance, and similar operations.

Other groups making substantial contributions were private contractors and commercial institutions, 1,052 man-years; State governments, 306; district managers and field assistants, 242; and local governments, 181. ♦

The lifetime quota of water usage for the average person in the U. S. is 3,500,000 gallons.

Recreation More Than Doubles Massachusetts Town's Population

FIFTEEN hundred families, comprising about 7,500 people, with all kinds of tents and trailers, camped on 150 acres of former cropland and more than doubled the population of the town of Belchertown, Mass., for 3 days in May this year. People seeking outdoor recreation caused this burst in population.

The New England Family Campers Association held its annual safari at the Robin Farm of Henry Renouf. The association scheduled many events in addition to its annual meeting. Horseshoe pitching, square dancing, swimming, and fishing were some of them. This is the second year that this event has taken place at this camping area.

Robin Farm is owned and operated by Henry Renouf, a long-time cooperator and district supervisor of the Hampshire Conservation District. Renouf, a former dairy and poultry farmer, in 1962 converted 90 acres to recreation.

He built a lodge and improved 90 campsites. This area soon grew to double this size, and last year he converted the whole 1,000 acres of his farm to recreation.

In 1963, the farm was put under the Cropland Conversion Program, all farming stopped, and the owner devoted his entire time to his recreational enterprise. Since that time, Renouf has installed several small ponds, leveled an area for a baseball field, built an 80-by-50-foot pavilion for dancing, constructed a country store, installed many feet of sewer and water lines, and improved woodlands for campsites. Future plans call for nature walks, wildlife plantings, more ponds—including one of 28 acres—and an enlargement of the camping area.

Facilities at Robin Farm offer the camper real outdoor living in pleasant country surroundings.—**VERNON E. JOHNSON, Work Unit Conservationist, SCS, Northampton, Mass.** ♦

Field once in alfalfa supports a crop of campers as the New England Family Campers Association gathers for its annual safari.



Timber Trends in the United States. BY U. S. FOREST SERVICE. 1965. *USDA Forest Resource Rpt.* 17. 235 pp., illus., charts, maps. \$1.75.

This is the current appraisal, as of 1962, of the Nation's timber resources. It also provides a look by the U. S. Forest Service into the Nation's future timber demands.

This report does not present a national forestry program as such. It does provide much of the data needed as a basis for forestry programs at national and local levels. State associations of soil conservation districts and individual districts could well use the information in updating their programs. If more local details are needed, they likely can be provided by the forest and range experiment stations that contributed to this national summary.

A notable difference between this appraisal and the 1952 Timber Resources Review is the inclusion of an estimate of the potential productivity of our forest land in terms of cubic feet of growth per acre. This beginning effort to estimate the inherent capacity of the land to grow commercial wood should be nurtured into full bloom to give us clear-cut ways of designating the woodland suitabilities of our land. When this can be done, the inventory and appraisal of our forest resources will be indispensable guides in making important land use decisions—**T. B. PLAIR, Woodland Conservationist, SCS, Washington, D. C.**

Soils: An Introduction to Soils and Plant Growth. BY ROY L. DONAHUE. 1965. 2d ed. *Prentice-Hall, Englewood Cliffs, N. J.* 364 pp., illus. \$10.60.

In this book Dr. Donahue has explained many of the basic prin-

ciples of soil science and their application with a minimum of difficult scientific language. It can be highly useful to students and to other readers lacking college mathematics, chemistry, geology, or botany. The book has good illustrations, a glossary, and references for further study. Well balanced books on soil science for readers having little previous experience in science are so rare that this one should be much appreciated.—CHARLES E. KELLOGG, *Deputy Administrator for Soil Survey*.

Trail Planning and Layout. BY BYRON L. ASHBAUGH. 1965. *National Audubon Society, New York*, 104 pp., illus. \$2.50 (25 percent off in lots of 10 or more.)

This is a guidebook of practical information on outdoor trail planning, specifications, and designs. Many aspects of using the outdoors for conservation education and recreation are covered. An 8-section appendix provides pertinent information about trail signs, leaflets, and sources of related publications, and sources of assistance from agencies and organizations. The book will be a useful guide for planners of nature centers, outdoor classrooms and laboratories, camps, and recreation areas.—ADRIAN C. FOX, *Information Division, SCS, Washington, D. C.*

New Publications

Decomposition of Wood and Bark Sawdusts in Soil, Nitrogen Requirements, and Effects on Plants. BY FRANKLIN E. ALLISON. 1965. *USDA Tech. Bul.* 1332. 58 pp., illus. 25c. Reports of extensive studies of the rates of decomposition in soils of the woods and barks of 28 species of trees, the quantities of nitrogen required for their decomposition, and their effects on germination and early growth of garden peas.

Predicting Rainfall-Erosion Losses from Cropland East of The Rocky Mountains. BY WALTER H. WISCHMEIER AND DWIGHT D. SMITH. 1965. *USDA Agr. Hbk.* 232. 47 pp., maps, charts. 30c. This handbook presents data and procedures for extending the

use of the soil-loss equation from the area of its origin, the Corn Belt, to the entire eastern and middle United States. It describes the evolution of the equation, explains the factors involved, and tells how to make application to varying local conditions.

Design of Roadside Drainage Channels. BY JAMES K. SEARCY. 1965. *U. S. Department of Commerce, Bureau of Public Roads, Hydraulic Design Series* 4. 56 pp., illus., charts, tables. 40c. A revision of a previous publication of the same title. Contains technical information on (1) estimating storm runoff from small areas, (2) hydraulics of drainage channels, (3) design procedure, (4) construction, (5) maintenance, and (6) economics of drainage channels.

Background on U. S. Agriculture. 1965. *USDA Leaflet* 491, rev. (8 pp. foldout). An updated collection of simple basic statistics about agriculture and agribusiness. Examples: One farmworker produces food, fiber, and other farm commodities for himself and 32 others. Three out of every 10 jobs in private employment are related to agriculture. Every USDA employee should have a copy handy.

Grass Varieties in the United States. BY A. A. HANSON. 1965. *USDA Agr. Hbk.* 170, rev. 102 pp., 50c. This handbook identifies and describes varieties and experimental strains of grasses that have been widely distributed for testing purposes. For each, it tells where the original selection was made, the source, and current status of distribution.

Pollution-Caused Fish Kills in 1964. 1965. *U. S. Dept. Health, Education, and Welfare, Public Health Service Publ.* 847 (rev.). 28 pp. Statistics on fish kills reported to the Public Health Service, with some excerpts from field reports. The data are significant as an indication of the severity of water pollution problems.

An Agricultural Processing Plant in Your Community? 1965. *USDA Agr. Inf. Bul.* 298. 11 pp. Factors to be considered in planning and operating an agricultural processing plant. Prepared by Agricultural Research Service as an aid to rural areas development.

Duck Stamp Data. 1964. *U. S. Dept. of Int., Fish and Wildlife Service Circ.* 111, rev. 40 pp., illus. 25c. Information for collectors, including reproductions of the stamps issued to date, and a report on how the resulting funds have been used.

National Forest Wilderness and Primitive Areas. 1965. *USDA, Forest Service.* 12 page foldout, map. Gives location and size of wilderness areas (units of the National Wilderness Preservation System) and primitive areas on the National Forests.

A Primer on Water Quality. BY H. A. SWENSON AND H. L. BALDWIN. 1965. *U. S. Dept. of Int., Geol. Surv. Unnumbered.* 27 pp. A basic explanation of properties of water and factors that influence its quality.

Ornamental Hedges for the Northern Great Plains. BY W. P. BAIRD. Rev. 1965. *USDA Farmers Bulletin* 2105. 34 pp., illus. Recommended species and planting methods for beauty and protection.

Community Improvement Through Beautification. BY FEDERAL EXTENSION SERVICE. 1965. *USDA PA-660.* 6 pp. Some simple suggestions, simply stated, for community action.

Facts about Resource Conservation and Development Projects. BY SOIL CONSERVATION SERVICE. 1965. *USDA, SCS-CI-14.* 4 pp. What they are and how to start one.

Water Witching. 1965. *U. S. Dept. of Int., Geol. Surv. Unnumbered.* 14 pp. An official appraisal of dowsing and some references on finding ground water.

Conifer Nursery Practice in the Prairie-Plains. BY J. H. STOECKELER AND P. E. SLABAUGH. 1965. *USDA Agr. Hbk.* 279. 93 pp., illus. 50c.

Changes in Farm Production and Efficiency. 1965. *USDA Statistical Bul.* 233, rev. 37 pp. A summary report, revised to July 1965.

Soil Survey

Lovelock Area, Nevada. BY L. N. LANGAN, E. COLE, AND R. MAYHUGH. 1965. 87 pp., illus.; maps 3.17 inches to the mile (1:20,000).

Franklin County, Alabama. BY HOYT SHERARD, R. A. YOUNG, J. P. BRYANT, SAM J. SMITH, AND JAMES A. GIBBS. 1965. 80 pp., illus.; maps 4 inches (1:15,840).

Wabasha County, Minnesota. BY G. F. HARMS. 1965. 131 pp., illus.; maps 3.17 inches (1:20,000). Field survey by L. E. Bullard, G. F. Sickler, D. A. Cowles, and G. A. Poch.

From the Administrator:

Lessons in Community Action



TEN Resource Conservation and Development projects are in the operations stage. Very soon we expect to begin providing planning assistance to at least eight additional RC&D projects.

In our close-working association with soil and water conservation districts since 1937 we have learned to appreciate and to depend on local leadership, local planning, local action, and local coordination of programs.

This appreciation of and dependence on local initiative was accentuated when we began assisting in Public Law 566 watershed projects in 1954.

Watershed projects extend the original district concept. They embrace a wider circle of community activity. They bring urban communities and nonfarm groups into the resource development picture to a much greater extent than previous district-sponsored activities. They add dams for flood prevention and water storage for multiple-purposes to the going program of conservation planning and treatment of privately owned farm and ranch lands. They offer complete watershed development to protect country and town alike from floods and to provide water supply for all uses including recreational developments.

Resource Conservation and Development projects are a natural outgrowth of district and watershed programs. They embrace these two activities, for RC&D projects are based on full development of natural resources and promotion of the use of such developments for the economic betterment of all the people.

They are rural development in a more complete way than soil and water conservation programs in

districts and watershed projects will ever be, for they go beyond the act of conservation; they build upon conservation under a long-range plan aimed at improving the economy of the area.

Young as the RC&D approach to our total job is, we have learned much from it, and we expect to learn a great deal more as planning and action move forward. Here are some of the lessons in community action we have learned from RC&D projects:

(1) People who live in RC&D project areas can and will enthusiastically accept responsibilities for developing and carrying out resource plans for community development. There is little limit to what a community can do once its mind is made up.

(2) Local people have to be convinced that public agencies and conservationists and other professionals *want* them to plan and that progress depends on their determination to help themselves.

(3) The role of public agency employees is to advise, stimulate, provide technical information, explore possible alternative approaches to resource development—and then step out and allow local people to make the decisions on what will be done and how it will be done. Local people know more about their resources and potentials than assisting agencies. Professionals must listen well to what local people have to say about resource development.

(4) Resource planning and development must be carried on with the *participation* and *support* of all people in the area. A few leaders working alone with public agency representatives can't do the job. People in the area must become personally involved in re-

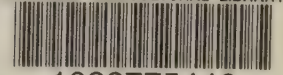
source planning and development. The very process through which a successful community plan for action is developed provides the leaders and sponsors a source of strength. The step-by-step consideration of community problems, opportunities, and aspirations—first in neighborhood groups, then by larger communities and conservation districts, and finally by the steering committee—provides a solid base for coordinated community action.

(5) Local people and public agencies working together as a team can accomplish more in resource development than can fragmented single-purpose groups and single-agency programs. All agency work is more effective when operating under local leadership and coordination. Indeed, the whole idea of RC&D projects is to use existing programs of all agencies, to eliminate duplication and confusion, to coordinate all programs, and to promote cooperation in the development of programs that will satisfy community needs.

(6) Some public agencies, which have not had the experience of the Soil Conservation Service in working directly with local groups in carrying out locally directed programs, find it difficult to understand and accept the concept of local people formulating and carrying out their own plans and shaping agency programs to meet local community objectives. Since the help of many nonconservation agencies is needed in most RC&D projects, part of our job, it seems to me, is to help them understand the concept of local leadership that has been the keystone of our operations since soil conservation districts began to organize in 1937.

(7) Leadership and coordinating action at the rural community level is effective in resolving agency differences.

(8) Probably the most important lesson is that resource planning must be totally directed toward action. —D. A. WILLIAMS.



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Maine Community Improves Picnic Area

Story on page 62



A traditional picnicking area in Eustis, Maine, has been converted into a public campground and recreation area under the sponsorship of a nonprofit development

corporation and with the assistance of the Soil Conservation Service, Farmers Home Administration, and State and local agencies.

Stately Norway pines provide

shade and an inspiring atmosphere for large, quiet campsites on the shore of Flagstaff Lake. A recreation hall, playgrounds, and nature trails have been added. ♦

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NOVEMBER 1965

VOL. 31 NO. 4

SOIL Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

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5 ~~Bonny~~ *just*

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Soil . . .

Seeking new knowledge about soils to make surveys more useful to more people is the job of a little known group of SCS scientists. Deputy Administrator Charles Kellogg arranged for Researcher Joe Kubota to report on significant studies of the relation of trace elements to animal nutrition (p. 77). The link between the mineral content of soils and livestock health in certain areas re-confirms the view of soil as the foundation of the pyramid of life.

Esthetics: The contributed article on soils in relation to planning landscape beauty by Cornell Professor Gerald Olson and New York State Soil Scientist Raymond Marshall (p. 84) underscores the new interests in soil surveys arising out of new concerns in land use.

Recreation: NACD's national inventory of outdoor recreation resources and facilities no doubt will require help from many SCS fieldmen. To explain what it's all about, Recreation Specialist Frank Edminster prepared our lead article (p. 75) about the purposes and rationale of the survey.

This survey promises to provide the first really thorough accounting, district by district, of both private and public recreation resources and needs. The findings need then to be translated realistically into the State recreation plans being prepared under the auspices of the Bureau of Outdoor Recreation.

COVER: An infra-red photo of an autumn ranch scene in the Midstate Soil Conservation District, Oregon, captures the kind of appeal to vacationers that can be counted in the recreation resources inventory.

Soil Conservation

Devoted to the wise use of land and water resources

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Recreation potentials, used and unused, will be evaluated in each conservation district.

Recreation Inventory

Conservation districts enumerate existing facilities, estimate potentials for new ones

SOIL and water conservation districts in 42 States and Puerto Rico are cooperating in a national inventory of private and public outdoor recreation areas and facilities.

The project is under leadership of the Recreation and Wildlife Committee of the National Association of Soil and Water Conservation Districts. Inventory data are expected to be complete and available early in 1966.

The effort is aimed at providing the first comprehensive summary of outdoor recreation resources in the Nation that includes a thorough inventory of privately owned facilities. It will enumerate all known existing facilities and will help to estimate potential developments from available information. The results will enable soil conservation districts to better extend their long-range programs to include recreation developments.

Local and regional data

State soil conservation committees, assisted by State recreation planning agencies and the Soil Conservation Service are expected to combine individual district inventory data to obtain State totals. These in turn will be summarized by regions and nationally.

Meanwhile, the Bureau of Out-

By Frank C. Edminster

Resource Development Division, SCS, Washington, D. C.

door Recreation is making a survey of public and private outdoor recreation areas based on a sampling procedure designed to provide data of regional and national scope. Information from this study will be used in a nationwide outdoor recreation plan due in 1967.

Recreation planning has advanced rapidly since release of the Outdoor Recreation Resources Review Committee (ORRRC) Report of studies that were completed in 1962. Plans for meeting future recreation needs are being pushed as fast as personnel and procedures allow.

Of wide general interest is the development of comprehensive statewide plans by States, spurred by opportunities and requirements of the new Land and Water Conservation Fund Act. Program planning for outdoor recreation by soil and water conservation districts has progressed well in most sections of the country.

The NACD Committee early recognized the need for standardization of procedures for recreation planning. Because of the nature of the outdoor recreation business with its highly mobile clientele, the ability to correlate local plans and to add them up for the purpose of broader planning is critical.

Steps in planning

Program planning for meeting recreation needs requires four steps or parts:

(1) An analysis of the existing situation—recreation areas and enterprises now developed to meet the current needs.

(2) An appraisal of resources not yet developed or only partly developed.

(3) An analysis of the prospective needs (market demand).

(4) A program to meet these needs.

The current inventory will have

accurate data on what kinds of recreation are now available, in what quantities, with what facilities, and where they are located. Soil conservation districts and others will know which areas are publicly owned, which are quasi-public or nonprofit group areas, and which are privately owned and operated for public use.

Once the present situation is known, we then need to determine the potentials for future expansion. This is the second step which involves an appraisal of resources that are now either undeveloped for recreation use or underdeveloped. This process not only concerns the full gamut of natural resources, but it also must consider human populations and certain aspects of the transportation system and of land ownership.

Judging resources

Appraisal of resources is more difficult than enumerating existing developments. Certain aspects lend themselves to quantitative analysis but many do not. Hence group judgment by qualified people is strongly involved. Further, the appraisal must be made separately for each kind of recreation area because "recreation" is too complex to be analyzed as a whole.

The number of kinds of recreation possibilities that need to be surveyed will vary from district to district. For convenience, 12 kinds are used in the NACD inventory of private enterprises. In an individual district, one or more of these may not be significant; or, one or more others may need to be added. They are: (1) Vacation cabins, cottages, and

homes; (2) camp grounds; (3) field sports areas; (4) fishing waters; (5) golf courses; (6) hunting areas; (7) natural, scenic, and historic areas; (8) riding stables; (9) shooting preserves; (10) vacation farms and guest ranches; (11) water sports areas; and (12) winter sports areas.

Many of these have two or more variations. For example, campgrounds may offer vacation site camping with tents or trailers, transient camping, or pack camping. Sometimes a real estate subdivision may deserve separate appraisal as a type of recreation area.

Each type of recreation area has a potential for development that depends on a number of things—elements of resources, human populations, etc. The most common elements that require consideration are the following: (1) Climate, (2) scenery, (3) natural areas, (4) historic areas, (5) soils, (6) existing water areas, (7) water impoundment sites, (8) wildlife habitat (including fish), (9) wildlife populations (including fish), (10) human population—size and distribution, (11) population—demographic characteristics, (12) population—income level, (13) proximity to cities, (14) highways and access roads, and (15) rural ownership characteristics.

A matter of judgment

The significance of each of these elements must be appraised for each kind of recreation. Factual information and statistics will be available for each, but in the end a judgment is required. For example, the climate in a given

area may be described in terms of the annual rainfall and its distribution, mean and extreme temperatures, number of sunny days, dependability of snow cover, wind directions and intensities, relative humidity, and the like. But each of these—and the total climate—must be *interpreted* in relation to each kind of recreation area. This interpretation may be in relative rather than absolute terms.

To illustrate, the summer climate in a certain conservation district may be quite favorable for vacation cottage areas in relation to the summer climate in several cities located 50 to 300 miles away. Although its climate may be far from ideal in absolute terms—by no means comparable to that in the Adirondack Mountains or the Grand Tetons—it would still be rated very good *in relation* to the climate where the customers live.

In the case cited, a group judgment appraising the climate in the district (or in various parts of it) would be needed despite the fact that abundant statistics are available. These data cannot be manipulated mathematically to get an answer; they can only be used as information to help reach a dependable judgment. However, it is desirable to have a procedure for this judgment-making process that can be used in many areas and lead to consistent, comparable results. For that reason, a scoring system will be used in appraising resource potentials for outdoor recreation.

The net result of the resource
(Continued on p. 91)

Small private recreation facilities will be counted as well as the larger public and community developments.



Soils and Animal Nutrition

Scientists study problem areas where trace elements affect livestock health

By Joe Kubota

Research Soil Scientist, SCS, Ithaca, N.Y.

SOME soils present problems to livestock growers because they contain too little or too much of certain trace elements that affect the nutrition of grazing animals that feed on the forage they grow.

To identify these soils and determine their distribution throughout the country so that soil maps can be made more useful to landowners is the aim of studies by a group of Soil Conservation Service soil scientists working with researchers of the Plant, Soil, and Nutrition Laboratory of the Agricultural Research Service at Ithaca, N.Y.

The two agencies are cooperating in studies that link soils, plants, and animals to explain problems of mineral deficiencies and toxicities in livestock.

By relating the results of investigations of selected test sites to kinds of soil, the researchers have been able to give direct suggestions to farmers and ranchers about potential grazing problems. The studies combine knowledge of soils with findings about the nutrition of plants and animals to make useful interpretations of soil maps regarding the use of land for grazing.

Study results have shown that vigorously growing forage plants on some soils may be of doubtful nutritional quality because of inadequacies or imbalances of certain micronutrients. This is especially true where the micronutrient requirements of the plant differ from those of the animal.

The cobalt problem is one example. Animals require more cobalt than do most plants.

Legumes need cobalt, but grasses have not been shown to need it. Within the rumen, cobalt is converted by microorganisms to vitamin B₁₂, which animals need for growth.

Where the plants fail to provide enough cobalt, other sources must be found. Soil applications of trace amounts of cobalt, grain supplements fortified with cobalt, and the injection of solid "bullets" of cobalt into the rumen have been used successfully.

Chocorua's Curse

Cobalt deficiency was observed by the earliest settlers in parts of New England, but the cause of the disease was not recognized. In New Hampshire, it was called "Chocorua's Curse" and "Albany Ail" from local place names. In southern Massachusetts, it was

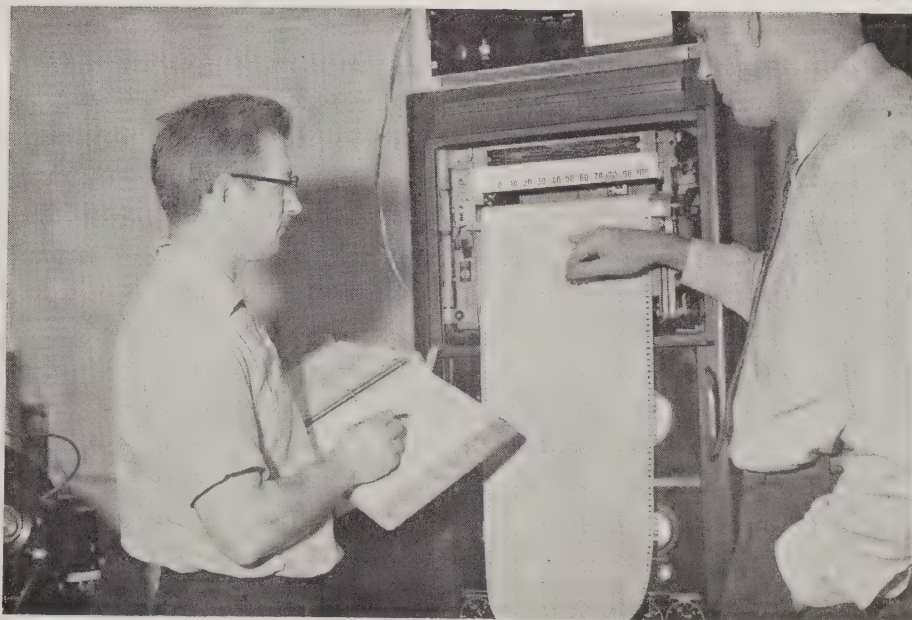
known as "neck's ail," not because the disease affected the neck of the animal but because it was most common on necks of land that projected into the bays.

It is now known that cobalt deficiency in New England has its origin in the geologic history of the soils. The low-cobalt soils of New Hampshire, for example, are formed in glacial deposits derived from granite of the White Mountains, which contained very little cobalt.

Moreover, the Spodosols (Podzol soils) in the area, formed from sandy glacial drift, tend to lose their cobalt by leaching. Cobalt moves downward at a more rapid rate than iron, especially in Spodosols of poor drainage.

Cobalt deficiency among grazing animals also is a problem on wet sandy soils of the lower Coastal Plain in Southeastern United States. The low-cobalt soils there are Humaquods—poorly drained sandy soils with organic pans. The original sandy deposits had little cobalt to begin with and that was leached from the upper horizons as soil development proceeded. Consequently, there is little cobalt available to forage plants growing in these soils.

The X-ray emission spectrograph is used to analyze the mineral content of plant samples.



Grazing animals show cobalt deficiency symptoms when the amount of cobalt in the soil is less than 1 to 5 parts per million. This approximates 1 to 5 pounds of cobalt in an acre of surface soil 3 to 4 inches deep. The analytical job is even more difficult with plants in which the investigator must detect 1 part in 100 million.

Molybdenum toxicity

In contrast with cobalt, the problem of molybdenum toxicity arises from the fact that forage plants have a wide range of tolerance for that element, but animals do not. Large amounts have no apparent adverse effects upon plant growth but are toxic to grazing animals. Legumes accumulate more molybdenum than do the common grasses.

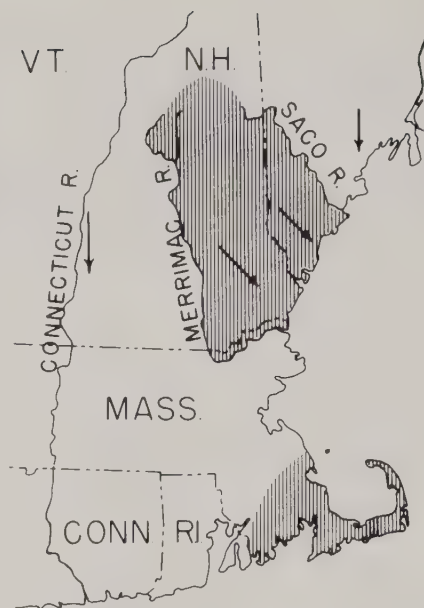
Molybdenum is essential for plant growth, but its role in animal nutrition remains to be determined. Because animals taking in too much molybdenum exhibit typical symptoms of copper deficiency, it appears that molybdenum limits the utilization of copper.

For practical purposes, animals can reasonably be expected to suffer if the molybdenum content of forage exceeds 10 to 20 parts per million. For reasons still unknown, grazed forage appears to be more toxic than hay with the same amount of molybdenum. In the United States the amount of molybdenum varies more among different species of plants than does copper.

Granite, shales, sandstones

Most of the problem areas of molybdenum toxicity in the Western States are related to the geologic origin and the wetness of the soils. The common sources of molybdenum are granite, shales, and fine-grained sandstones.

Critical areas of molybdenum toxicity commonly occur on wet flood plains, alluvial fans, and terraces of small streams built



Low-cobalt areas (shaded) in New England. The arrows indicate direction of glacial movement.

up mainly of these geologic materials. Such areas are rarely found along large rivers where the alluvium came from many sources. The material coming from rocks low in molybdenum effectively dilute large concentrations contributed by any single stream out of the molybdenum-rich rocks.

Granite of the Sierra Nevadas is the primary source of molybdenum in soils of California and Nevada where grazing animals suffer from molybdenum toxicity.

Poor soil drainage affects how much molybdenum a plant takes up. Legumes grown in wet soils take up more molybdenum than similar plants grown in well-drained soils having the same molybdenum content.

The spectrograph tells

The X-ray emission spectrograph is a valuable tool in detecting molybdenum in forage. Levels of molybdenum of the order of 4 or more parts per million can be determined directly in finely ground plant material. The determination of copper also is essential in the study of molybdenum-toxic forage, but the micro-

nutrient must be determined by a chemical method.

It is possible to use forage plants high in molybdenum as animal feed. An effective treatment is direct injection of copper glycinate. An alternative is to harvest the forage and feed it as hay with the animals having ready access to salt with copper added. No soil treatment that could materially lower molybdenum content of forage is known.

The problems of cobalt deficiency and molybdenum toxicity in grazing animals are closely related to the origin and distribution of soils. Soil scientists, plant scientists, and veterinarians, therefore, are all involved in controlling the soil-plant-animal chain to assure healthy animals. ♦

White House Conference Scheduled This Month

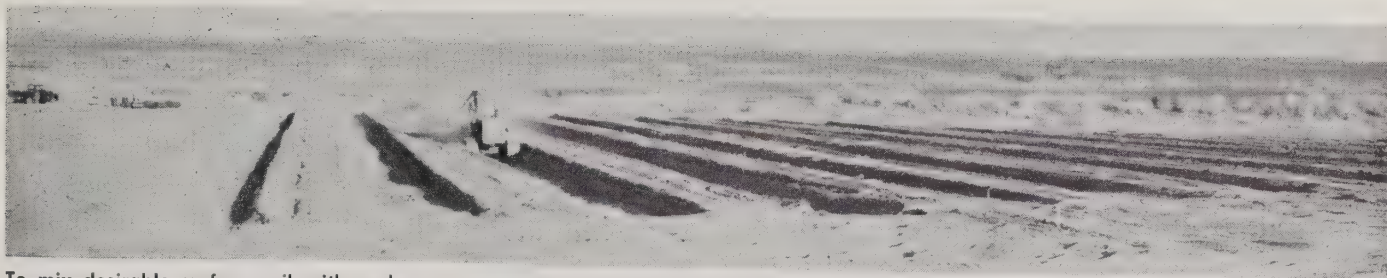
Twenty-eight national committees have been at work in 1965 during International Cooperation Year (ICY) to focus attention on cooperation instead of conflict in international affairs.

Their efforts will culminate in a White House Conference on International Cooperation, November 29 to December 1.

ICY has two main goals: (1) To publicize and review the public and private international cooperation that has been going on for two decades. (2) To plan new and better means of international cooperation in the future.

The idea of ICY was first proposed by the late Prime Minister Nehru of India in 1961 at the United Nations.

The committees are made up of both government representatives and private groups in many fields. USDA is represented on several. Mrs. Dorothy H. Jacobson, Assistant Secretary for International Affairs, is chairman of the Food and Agriculture Committee. ♦



To mix desirable surface soil with undesirable subsurface material, the farmer excavates strips the width of the scraper and levels the intervening strips.

Remaking the Soil

El Paso irrigation farmers swap or mix sand and clay to improve water use

By Hubert B. Jaco, *Soil Scientist, SCS, El Paso, Tex.*

“HOW deep is it to sand? Where can I find clay to mix with sandy soil?”

Irrigation farmers in the El Paso Valley of the Rio Grande in Texas get answers to these questions from SCS soil surveys to guide them in “swapping” soils.

Many irrigated fields in the El Paso-Hudspeth Soil Conservation District have been improved by mixing sand and clay. The farmers study their soil maps and understand the characteristics of the different kinds of soil before undertaking such a job. Otherwise, the results are likely to be disappointing, and may even be damaging to the land.

Soil surveys are also used to design the irrigation systems, particularly to determine the length of runs for water and the amount of water to apply.

For efficient irrigation

The need for soil-swapping arises from the fact that soils of different textures—sand, silt, loam, and clay—have different water-holding capacities, and different soils often occur in the same field.

To be irrigated efficiently, a field needs to be as uniform as possible in soil texture. In the El Paso area, efficient use of the limited water supply is important, and farmers do everything they can to achieve this goal.

For example, a field may be

mainly of Gila soil with a silty clay loam surface layer and a loam subsoil. In the middle of the field there may be a narrow strip of 1 or 2 acres of Brazito soil with a fine sandy loam surface layer and a fine sand subsoil.

If the field is irrigated correctly to meet the needs of the Gila soil, plants growing on the Brazito area will wilt because water is not applied frequently enough. But, if the Brazito soil is irrigated correctly, the larger area of Gila soil will be irrigated too often with

too little water.

In such a situation, many farmers search for an area of clay in another field the same size as the sandy soil area. The clay area usually has a poor stand of crops too, because of drowning or surface crusting. The soils are “swapped” by taking 5 to 10 inches from the surface of the sandy soil and trading it for 5 to 10 inches of clay soil from the other field. Then, by plowing and disking to mix the clay with the sand, a satisfactory soil texture for the whole



Large earthmoving equipment is called into play to reshape fields and modify soils in the El Paso irrigation district.



A front-end loader picks up "adobe" soil to be "swapped" for sand from another part of the field.

field is obtained.

Another problem in the valley is the presence of many old narrow river channels. These make fields that are inconvenient and expensive to farm. Many of these fields are underlain by a high water table causing a salt problem.

Farmers use soil maps to locate areas of good soil for use in filling the old river channels to the same level as the adjoining fields. This can require deep cuts in higher fields. A farmer uses the soil map to determine if he will find sand or other undesirable soil material in making deep cuts. If so, he cuts strips in the field the width of a scraper, leaving uncut strips of equal width. The uncut areas are then spread to fill the cuts.

Large areas of heavy soils that are high in lime and contain more than 50 percent clay are another problem. They form hard surface crusts that hinder emergence of seedlings. Spotty stands of cotton and alfalfa occur on these soils. Often they have to be replanted.

Many farmers use hoes, rakes, or pitchforks to scratch the surface to help cotton seedlings push through the crust. This is very expensive. A soil survey can be used to locate sandier layers that can be brought to the surface by deep plowing and mixed with the clay surface soil to form a less

crusty plow layer.

Most farmers who deep-plow or "swap" soil own their own equipment and use their regular operators to run the machinery. They recognize that the practice must be carefully done and should not be done at all without good soils information. ♦

Conservation on School Grounds

HOUSTON County, Tenn., school officials recently gained firsthand knowledge of how a school expansion program can create problems in soil and water management.

Enlargement of classroom and playground areas at Erin and Tennessee Ridge Elementary Schools resulted in heavier water runoff from the school grounds during rainstorms.

Superintendent of Schools Billy G. Alsobrooks asked the Houston County Soil Conservation District for assistance. The Soil Conservation Service helped develop conservation plans for both school grounds.

At Erin Elementary, construction of an adequate and safe water disposal system was complicated by a steep hill behind the school. To overcome this and other drain-

age problems a series of diversion ditches and sod waterways was built.

At Tennessee Ridge Elementary, the main problem was disposing of surface accumulation during and after rains. This was provided for with a series of sod waterways.

Ball fields, diversion ditches, and sod waterways were limed and fertilized, then seeded with fescue grass and mulched with straw. Now the topsoil is held firmly in place by a dense sod.

"Almost as important as the conservation work, we wanted to impress on our children and the citizens of our county that good conservation practices can and must be a part of our lives," Superintendent Alsobrooks said. —JAMES L. BILYEU, *Work Unit Conservationist, SCS, Erin, Tenn.*

Supervisors Lead School Field Day

(Photo on back page)

SUPERVISORS of three soil and water conservation districts served as guides for some 350 sixth grade students on a conservation field day tour in Douglas County, Wash., last spring.

Federal, State, and county conservation specialists joined in providing instruction at the Badger Mountain ski area near Waterville under the direction of Bob Johnson, Douglas County Extension Agent. Supervisors of the Foster Creek, Douglas, and East Wenatchee districts, all in Douglas County, arranged the event and directed the groups of students.

Training in conservation of soil, water, and rangeland was conducted by SCS conservationists. At the soil station, students were shown soil profiles, told how soil is formed, and that food comes from a comparatively thin layer of topsoil.

Conservation practices dealing with water were explained at an-

other station.

Children were shown bluebunch wheatgrass and Idaho fescue plants at the range conservation station. These plants are important forage producers on native ranges in the Pacific Northwest. Students learned that overgrazing kills stands of native forage and allows less desirable plants to invade pastures.

The Washington State Game Department had installed a wildlife watering facility on the site, and the local game protector gave instruction in wildlife management.

A bright red truck filled with fire-fighting equipment was featured at the Washington State Department of Natural Resources' station where students were told that man starts 90 percent of all grass and forest fires.

The children learned to identify many of Washington's evergreen trees at the woodland station. The U. S. Forest Service supplied the instruction.

A conservation booklet prepared by the instructors helped the children prepare for the field day.

The conservation day was so successful, its sponsors hope to make it an annual event.—ERNEST A. BUSEK, *Work Unit Conservationist, SCS, Mansfield, Wash.* ♦

Recreation in Watershed Projects

Fifty-five recreational developments in 50 watershed projects in 25 States had been approved for cost-sharing assistance under Public Law 566 as of June 30, 1965. These developments involve added reservoir capacity, land, and such recreational facilities as docks and ramps, beaches, roads and trails, and picnic areas, and will cost about \$18,592,000. Federal assistance amounts to \$9,204,000, the local share \$9,388,000. When completed, the projects will draw about 3 million recreation visits a year. ♦



The Hamerly Lutheran Church and cemetery lie in the protection of a windbreak that stills the drifting snow.

Dakota County Gets Early Start In Landscape Beautification

By William E. Purdy

Work Unit Conservationist, SCS, Mohall, N. Dak.

SHOULD the current crusade to beautify our American country side become a competitive race, Renville County, N. Dak., would quite probably be called back for jumping the gun.

Rural beautification and community betterment have been goals of this county's citizenry for several years now, thanks to the leadership of the Renville County Soil Conservation District and technical assistance from the Soil Conservation Service.

Cities, churches, and schools of the county, cooperating with the soil conservation district, have proved that conservation not only has a place on the farm but also plays an important role in community growth, beautification, and improvement.

The city of Mohall has been one of the leaders. Members of the Mohall Country Club planted a

multiple-row windbreak on the west side of their golf course several years ago and later added other plantings around the clubhouse.

During 1964 the club prepared more ground and in 1965 planted a wildlife area and numerous single-row windbreaks along the fairways. The North Dakota Game and Fish Department, in the interest of wildlife habitat, furnished the trees and paid the Renville District for planting them.

Screen for dumpground

Mohall's dumpground, long an eyesore along the highway near the city, will soon be hidden from view by tree plantings as a result of a joint endeavor started 3 years ago by the city planning commission, the local FFA chapter, and the conservation district. The trees not only will screen the dump-



Trees being planted around Mohall, N. Dak., will provide protection from wind and snow and add beauty to the city.

ground, but also will serve as a snow fence to keep the approach road open.

Bob Wright, a soil conservation district cooperator, has planted windbreaks on the west side of town and can be given much credit for helping to keep snow out of the downtown area. The Mohall City Planning Commission also has one-row windbreaks across the north end and around the south-east part of town.

Not to be outdone, other towns have gotten into the act. Sherwood might not have a forest but it has a wildlife planting on the west side of town, established in 1963 through the cooperation of the State Game and Fish Department.

A multiple-row field windbreak along the west edge of Tolley also helps keep the snow out of that town and provides food and cover for wildlife.

Glenburn is planning a city park and using the SCS soil survey for guidance. The town is planning a wildlife habitat tree planting.

Mouse River Park plans

The Renville County Park Board, a cooperator with the soil conservation district, has asked for assistance in improving the Mouse River Park. SCS has furnished a soil survey and an enlarged aerial photo for long-range planning of this recreational area.

Many churches and schools also have planted protective tree belts. One of the nicer ones shields the

Hamerly Lutheran Church and last winter kept snow out of the church yard and cemetery.

To encourage small plantings like these, the conservation district has furnished trees free to schools and churches. Many groups throughout the county have taken advantage of this offer to protect and beautify schools, cemeteries, and town halls.

The activities of the Renville County District are right in line with the current beautification efforts of Government and private interests throughout the Nation. Renville County is out in front and aims to stay there. ♦

Soil Scientist Floyd Hauff uses a power core sampler in survey of Mohall Country Club grounds as golfers play in the background.



Profit, Pleasure in Winter Wonderland

WE really enjoy the winters," says Mrs. Ezra Thompson of Madison, Maine. "They are going too fast for us."

Mr. and Mrs. Thompson have a "winter wonderland" on their 523-acre Spring Brook Farm. They have turned what could have been a long, cold winter into happy hours.

The Thompsons bought two snowmobiles and are renting them to people for joy rides over cleared trails through the woods and fields on their land. Thompson said that these rides, about 12 miles long, are almost as scenic on a nice clear night as they are during the day.

The Thompsons became cooperators with Somerset County Soil and Water Conservation District in 1959. Their conservation plan was based on a dairy herd of 50 Guernsey milk cows with 20 replacements, all grass farming and no grazing.

In 1964 their plan was revised to include a recreation enterprise including the motor-sled trails, a gunnery range, tenting sites, and hunting cabins. They are now looking into the possibility of developing a 15-acre water impoundment for wildlife-recreation. — HOWARD L. BURPEE, *Work Unit Conservationist, SCS, Skowhegan, Maine.* ♦

Nearly one-third of the 18 million people over 65 in the U.S. live in rural areas. ♦

Now they're doing it over...

Pioneer Soil Scientist Watches County's Need for Survey Grow

By Paul E. Davis, Soil Scientist, SCS, Trotwood, Ohio

MONTGOMERY County, Ohio, is getting a new soil survey. Not many people remember the original survey, made back in 1900 when soil science was in its infancy.

One man remembers well, though: He's the one who did it.

Dr. George N. Coffey, now 90 and living near Wooster, made the survey along with the late Clarence W. Dorsey. It was the first in the State and one of the first in the country to be published.

A pioneer in the field of soil science, Dr. Coffey has greatly influenced the development of soil surveys in the United States.

In the 1900 survey, Dr. Coffey cataloged 5 kinds of soils in the county. The survey now under way already has classified 72 different kinds of soil. Increased knowledge and more intensive use of the land have led to more detailed mapping and classification of soils.

According to Dr. Coffey, the county has changed much since he and Mr. Dorsey surveyed it. The original publication supports his recollection. It reported that the average farm contained from 100 to 120 acres and that there were long stretches of native forest. Farms were selling at \$60 to \$100 an acre.

The scene is different today—the long stretches of native forest have given way to second growth timber in woodlots and on the steep slopes. Land values are up, the trend is to larger farms, and the investment in machinery alone is often more than the farmer of 1900 had invested in his entire operation.

There is increasing competition for the use of the land, too. The population of Montgomery County has grown from about 130,000 in 1900 to more than 527,000 today. Roads, housing developments, shopping centers, schools, parking lots, and playgrounds are spreading across the landscape.

It's no wonder, then, Dr. Coffey commented, that soil surveys today are of more use to more people than ever before. The 1900 survey was of use only in farming, he pointed out, while today's surveys also are used by homeowners, contractors, real estate developers, health departments, school boards, planning commissions and consultants, highway departments, and land appraisers.

For example, the Federal Land Bank and other financial institu-

tions are using the available Montgomery County detailed soil maps to make land appraisals for farm loans. The Regional Transportation Board has used a general soil map of the county for planning purposes and anticipates using the detailed survey to even greater advantage.

Schools have used the soil survey in locating building sites and selecting suitable tree species for forestation programs.

On the other hand, there are many instances of costly land use mistakes that could have been prevented had a detailed soil survey been available and used. For example, public funds are being required to correct flooding of basements in some parts of the Dayton area. The houses involved were built in wet areas that a soil survey would have indicated as poorly suited for home building or plat development.

Another example, familiar to residents of the county, is flooding of the Eldorado and Miami Villa plats. A soil survey map would have shown these plats as hazardous sites. The land could have been developed as recreational areas and parks.

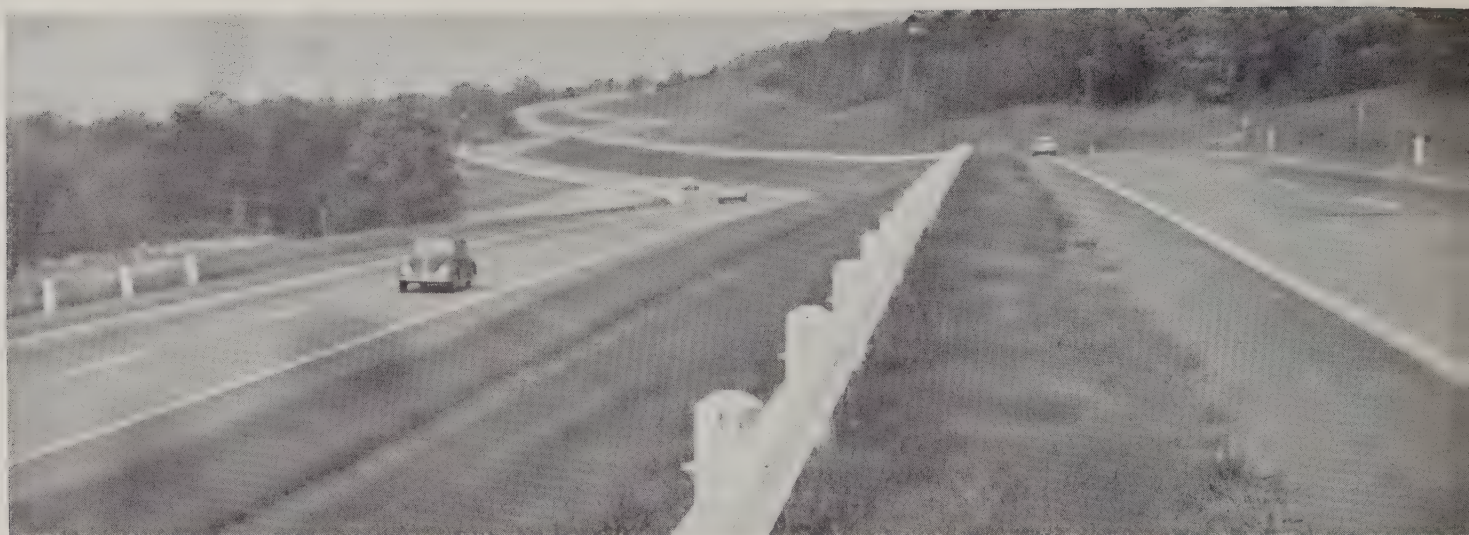
It was such problems as these, as well as the realization that greater competition for land and a growing population called for more sound land use, that prompted the board of supervisors of the Montgomery Soil and Water Conservation District to request the Soil Conservation Service to make a modern soil survey of the county.

The new survey was begun in 1962. To date, soils have been studied and mapped over more than 165,000 acres of the county.

The field mapping part of the survey is scheduled for completion in 1968 and will provide much of the needed data for land use planning. In the meantime, much survey information is available to land users and land use planners. ♦

Dr. George N. Coffey (l.), who surveyed Montgomery County in 1900, talks with the author, who is assisting in a modern detailed soil survey of the county.





Key to beauty on the land...

Soil Survey Is Guide to Esthetics in Land Use

By Gerald W. Olson and Raymond L. Marshall

Soil Technologist, Department of Agronomy, Cornell University, Ithaca, N. Y., and State Soil Scientist, SCS, Syracuse, N. Y.

WISE use of the soil survey in land use planning and development can help to maintain and improve the beauty of the natural landscape.

Attention to soils information enables us to take advantage of the variations in soils that help make our surroundings excitingly different from one place to another rather than monotonous and drab.

The uniqueness and charm of individual places are due in large part to soil characteristics, such as relief, drainage, rockiness, texture, or factors of soil formation such as climate, vegetation, topography, geology, and time. Sometimes cities and towns are named for prominent soil characteristics in the area. Rocky (Okla.), Boulder (Colo.), Gravelly (Ark.), Sandy (Oreg.), Silt (Colo.), Clay (Ky.), Earth (Tex.), Black Earth (Wis.), and Red Bank (N.J.) are good examples.

Man can alter and substantially change his environment. Literally, mountains and hills can be moved by sheer power of earthmoving equipment. The results can either mar and detract from the scene or they can harmonize with and emphasize its pleasing features.

Highways for beauty

Highways are excellent examples of manmade features that can complement the landscape. Besides their utilitarian function as arteries of commerce, they can give esthetic satisfaction to the traveler when they enhance natural beauty. A highway that fits naturally into its surroundings gives the user the feeling that he is a part of and belongs to the land.

In New York State, highway planners use soil survey information in deciding locations and engineering features of highways. In addition, they can use soil surveys

to help select locations that have beauty as well as utility.

Pipelines and powerlines also crisscross our landscape, often with detrimental effect. By using soil surveys, contractors can locate these important life-lines in suitable places and revegetate the disturbed areas in harmony with the landscape. By avoiding certain soils where corrosion of pipelines would be rapid, they can save considerable expense of maintenance.

Soil surveys can be used for almost every kind of development of land, because they describe the landscape so completely and in



A highway near Syracuse, N. Y., winds gracefully around the contour of the land to fit the natural landscape.

Machinery stands ready to reshape the earth to accommodate a population on the go. It will create a highway that has beauty as well as utility.

such great detail. Imaginative developers can extract a great deal of important information from soil maps.

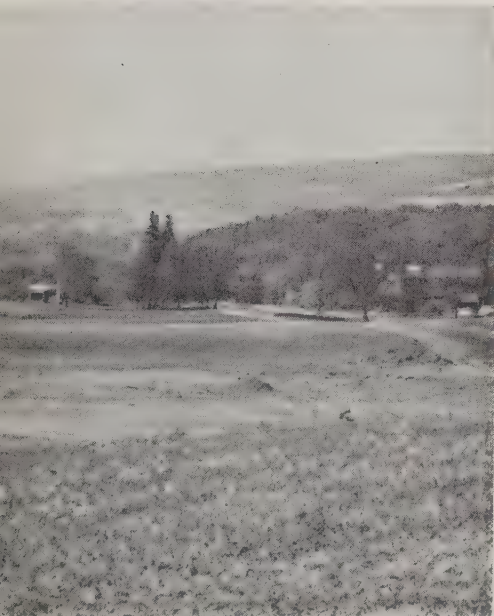
For example, the soil survey provides valuable information to the prospective developer of a ski hill. From a soil map on an aerial photo, location and direction of different slopes can be determined. Forest cover also is shown.

Interpretive maps can be made to show suitability of different areas for parking lots, building foundations, potable water supply, subsurface sewage disposal, hiking trails, bridle paths, landscaping, and other uses.

Soil surveys provide invaluable information to the developer interested in selecting a site for a rec-

Soil survey information was used to develop this ski area near Bristol, N. Y.

A golf course in a quiet valley near Moravia, N. Y., will blend into the surroundings and complement the beauty of the landscape.





The corrosive properties of different soils and their ease of revegetation are important in the location of pipelines.

recreation development that includes year-round cottages, washrooms, bathhouses, picnic shelters, and service buildings. Major items affecting this use are wetness hazard, flooding hazard, slope, depth to hard bedrock, degree of stoniness and rockiness, and shrink-swell potential of the soil.

Septic tanks may also be needed for subsurface sewage disposal. Items affecting this use include soil permeability, ground-water level, depth to impervious layers, and kind of bedrock.

Finally, information in relation to hillside slippage, frost heaving, piping loose sand, and low bearing capacity of the soil when wet needs to be known. Such information is recorded in soil descriptions prepared during the soil survey. The descriptions can be used to rate soil limitations of the site and to prepare interpretive maps showing these differences. Some detailed onsite investigations are usually

required for selection of a specific building site, but the soil survey can provide the preliminary information needed.

Early solutions

Careful land use planning with the soil survey will solve many little problems before they become big ones. For example, lakeshores that have been despoiled by pollution from unplanned developments will eventually have to be cleared and rebuilt in order to adequately serve future generations. But for lakeshores being developed now, the soil survey shows which sites are best for cabins, beaches, and sewage disposal. By building on the right kinds of soil the beach areas can be kept free of pollution, and the lake will remain beautiful and clean for future generations. Nearby areas, if carefully developed, will extend the esthetic value of the lake.

A golf course near Moravia, N.

Y., is a good example. It will provide recreation for many people, and the esthetic landscape development will provide a beautiful scene with Lake Owasco in the background. Soil experts made onsite investigations of the site before construction started, enabling planners to locate areas shallow to bedrock and confine earthmoving to the deeper soils.

Encouraging the development of the wildlife resource adds to the esthetic quality and recreation opportunity of the countryside. The ease of establishment and development of particular kinds of habitat that produce and support specific kinds of wildlife can be rated by using the soil survey of the area. Important items in these ratings include the suitability of the soil for growing grain crops, its ability to hold water for ponds, and amount of natural cover.

Wise land development making full use of all resource inventories, including the soil survey, will assure that future generations enjoy surroundings of the highest esthetic quality the landscape can provide. This is soil conservation at its best. ♦

SCS Biologists in Recreation Seminar

Four SCS biologists will participate as lecturers in a seminar in "Resource Management for Outdoor Recreation" during the fall semester at Mississippi State University.

W. W. Neely, State biologist for South Carolina, will lecture on "Brackish Pond and Wetland Management;" Dr. Roy Grizzell, Arkansas, on "Recreational Possibilities on Agricultural Lands and Waters;" and Edward Sullivan, Mississippi, and Olan Dillan, Regional Technical Service Center, Ft. Worth, Tex., on "Watershed Planning and Management." ♦

U. S. farmers use 5 million tons of steel a year, a third as much as the automotive industry. ♦



A dry hydrant by Paul Queneau's pond pumps a good stream of water during Cornish Fire Department School exercises.

"Dry" Fire Hydrants Protect Land And Homes in Rural New Hampshire

By **E. Malcolm Strom**

Assistant State Conesrvationist, SCS, Durham, N. H.

AN improved roadside "dry" hydrant is bringing better fire protection to rural residents in New Hampshire.

The idea of a dry hydrant is not new. It is hooked up to a pond, stream, or other rural water source rather than to a pressure-type municipal water system. But Floyd V. Barker, SCS work unit conservationist assisting the Strafford County Soil Conservation District, and SCS Engineer, Henry S. Stamatel developed a workable, inexpensive hydrant that is becoming increasingly popular with the fire departments and landowners throughout New England.

Fire chiefs like it

Almond "Red" Watson, chief of the Gilford, N. H., Fire Department, is one of its strongest supporters. "If the fire is near where a hydrant is installed it will easily save 10 to 15 minutes, and we fig-

ure this very often is the point where you save or lose a building," Watson said. He considers the hydrant "the cheapest insurance you can buy."

Verne Bucklin, captain of the Meredith Fire Department, credits the dry hydrant on the Marshall Hodson farm with saving his neighbor's buildings in a fire.

The Gilmanton Iron Works Fire Department raised the money to build a pond behind the fire house and installed a dry hydrant at the front door of the station. "Great protection for the village, and easy to refill our tank truck, too," said Fire Chief A. Richard Price.

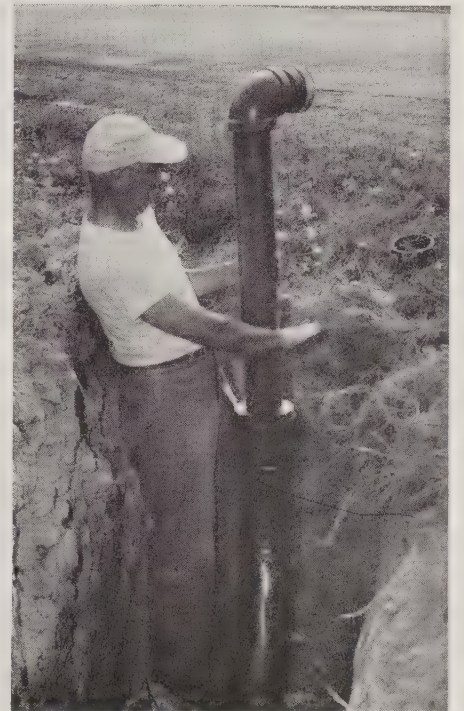
Easy access

The hydrant makes many water sources in rural areas available to modern fire fighting equipment, particularly during the snow and mud seasons. Properly installed,

a dry hydrant solves the access problem where costs of road construction and maintenance are high.

It works well in winter weather, too. Firemen at Walpole tried it one night at 10 degrees below zero and it worked perfectly.

Floyd V. Barker, SCS conservationist who developed the dry hydrant, checks height of the standpipe.



The hydrant consists of a vertical 3-foot length of 4-inch diameter black iron pipe threaded at both ends. A 4.5-inch, standard thread, steamer nozzle is attached to one end of the pipe with a 4-inch nipple and a 90-degree elbow. On the inlet end of the pipe a 4- to 6-inch reducer-adaptor receives the 6-inch intake pipe.

What it is

When installed in the field, the hydrant is attached to a 6-inch bend. Standard lengths of pipe are connected to the bend and extended into the water source. A 16-inch diameter metal form set around the hydrant at ground level and filled with concrete protects the hydrant against accidents and frost. Gravel is used as fill around the hydrant to provide surface drainage.

Water-Saving Siphon Replaces Irrigator's "Wooden Nightmare"

A SMALL group of Idaho farmers are resting more comfortably now since they replaced an old 230-foot wooden flume, called the "wooden nightmare," with a welded steel inverted siphon.

They not only rest more comfortably, but they have tripled their irrigation water flow and eliminated costly maintenance.

The old flume that carried irrigation water to four farmers across Spring Creek near Sterling rested on an unstable foundation and was supported by rotting timbers.

The four water users cooperated through the South Bingham Soil Conservation District to revise their irrigation systems and replace the siphon. Soil Conservation Service engineers made the necessary field surveys and designed a 275-foot inverted 23-inch welded steel siphon to carry 300 miner's inches (about 2,700 gallons per minute) of water—200 more than that carried by the old flume.

The increased flow now enables

To minimize freezing, installations are placed so that water in the inlet pipe will be at least 5 feet below ground level. The inlet pipe is located a minimum of 2 feet off the pond bottom.

The hydrant can deliver up to 500 gallons a minute.

District sells kits

Dry hydrant kits have been sold by the Strafford County District since 1960. The kits contain all materials needed for installation. The average dry hydrant costs approximately \$200; the kits cost only \$75.

Inquiries have come from fire departments, fire wardens, and insurance firms in 16 States and Canada. It appears the dry hydrant is no longer confined to northern New England. ♦

two of the farmers to irrigate at the same time. Before only one could irrigate and then with just a partial irrigating stream.

Cost of the project was shared by funds from the Agricultural Conservation Program.—WILFRED HASFURTHER, *Agronomy Specialist, SCS, Boise, Idaho.* ♦

Land Leveling Is Cure for Turnips

THERE was trouble in the turnip patch at Bush Brothers Farms in Greene County, Tenn.

Ponding water was ruining the turnip-green crop on a 100-acre field. The field, part of a 400-acre tract at the junction of Lick Creek and the Nolichucky River, lay on low terraces and had an uneven surface with hummocks and shallow depressions. This caused ponding after heavy rains or irrigation.

The wet soil prevented effective insect control and slowed harvest-

ing operations, resulting in serious losses to the company.

S. B. Bush, president of the firm, applied to the Greene Soil Conservation District for help. SCS conservationists advised reshaping the land. The project involved moving about 50,000 cubic yards of earth at a total cost of about \$9,000.

Other practices applied on the farm included stream channel improvement, grassed waterways, drainage field ditches and diversions, conservation cropping systems and cover crops, pasture and hayland planting, a sprinkler irrigation system, and tile drains.

The "trouble in the turnip patch" is now at an end for the Bush Brothers. They are getting much higher quality turnip greens and easier harvesting. The practice is catching on in other areas in eastern Tennessee. — CLARENCE RICHARDS, *Work Unit Conservationist, SCS, Greeneville, Tenn.* ♦

Hilltop Farm Shifts From Food to Fun

Drake's Hill Top Farm in Houlton, Maine, is starting its second century with a change from production of potatoes and beef to development of a recreation enterprise.

The farm, overlooking the town of Houlton, has been in the Drake family since 1854.

Increased demand for recreation by people in the Houlton area and increased need for camping sites by visitors encouraged Lyman Drake and his son-in-law, Eugene Bell, to convert the farm to a golf driving range and a camping and tenting area.

During 1963, Drake and Bell participated in the pilot Cropland Conversion Program. With technical help by the Soil Conservation Service, they built a pond for fee fishing and planted trees on areas not needed for recreational sites.—RANDOLPH H. WEST, *Work Unit Conservationist, SCS, Houlton, Maine.* ♦

Conservation Makes Good Cattle and Good Land

GOOD ranch management takes careful planning—and sound conservation grass management. A convincing example is the Katy Ranch, west of Barnard, S. Dak.

Humphrey Taylor has managed the ranch, owned by the Kelley Land and Cattle Company, for 12 years. He has carefully studied every aspect of his operations to find the figures—in pounds, percentages, dates, and inches—for most efficient operations. He is carrying out a range conservation plan as a cooperator with the Brown-Marshall Soil Conservation District.

The ranch has 3,000 acres of cultivated land and 1,960 acres of native rangeland. All cultivated land is seeded to a tame-grass mixture of alfalfa, smooth brome, and crested wheatgrass with a companion crop of oats.

The mixture is sown early in the spring, to take advantage of ample moisture to sprout the seed and start plants growing. Oats are sown first, using a drill behind a plow. Then the grass is planted with a special seeder that rolls the ground first, broadcasts the seed and packs the seed in afterwards.

To guard against erosion on the pasture slopes, Taylor has installed contour furrows laid out by the Soil Conservation Service to hold a 4-inch rain.

The cattle herd is moved to fresh pasture about every 10 days so the cattle are always on easy-to-get



Katy Ranch cowboys on one of the tame-grass pastures (from l.): Bill Spicer, Jerry Head, Edgar Head, and Terry Taylor.

grass. They don't have to spend much effort—and calories—looking for forage.

Cattle are not put into a pasture unless the grass is at least 6 inches high. And they are taken off before the grass is pastured down closer than 3 inches, under the conservation cattleman's golden rule of "take half and leave half."

Watering facilities are located where the livestock can get water without traveling more than half a mile.

The Katy Ranch has broken the pasture season into three parts:

Spring (Apr. 1-May 1): Five hundred acres of native grass with draws and coulees for spring calving are used. Hay is spread on a different area of native pasture each day.

Summer (May 1-Sept. 1): Cattle are turned onto the eleven 160-acre tame pastures. They are

moved from one pasture to another every 10 days, giving each pasture about 4 weeks' rest.

Fall (Sept. 1-Oct. 30): The livestock are put on 700 acres of native grass not used in the spring.

During November and December, a combination of hay and pasture is used. From 300 to 400 acres of tame grass is cut and rolled into bales. The bales are dropped from the baler without being tied, and cattle feed on them until the first of January.

The results of careful operations? "Our class II and III land in this 18- to 20-inch rainbelt makes a larger net return from well-managed grassland than it would from cultivated crops," Taylor says, "and it is one of the best means of protecting and improving soil and water resources." —WALTER N. PARMETER, *Agronomist, SCS, Huron, S. Dak.* ♦

Cowboys round up cattle on an alfalfa-brome pasture on the Katy Ranch.



Groups Correct Water Damage

WHITE and Negro land owners and timber companies in Louisiana are working together in soil and water conservation districts to end water damage to their acreages.

One group in Allen Parish moved 100,000 cubic yards of earth to protect 2,100 acres of cropland, pasture, and woodland.

Prior to the work done through the Calcasieu Soil and Water Conservation District, floods had swept away standing rice crops at least once every 4 years. Only weeds that could stand the water grew in the pastures. Timberland produced only scrub hardwoods.

The Soil Conservation Service helped design and lay out a 5-mile long main ditch. Cooperators leveled their riceland for better use of water.

The Agricultural Stabilization and Conservation Service shared the cost of earthmoving. Other help came from the Parish Police Jury (county governing body), the district attorney, and the State Highway Department.

Today rice crops are safe. Fine pastures of good grasses and legumes have replaced the weeds. One lumber company is experimenting with pine seedlings on land where once only water-loving tupelo gum grew.

In northeast Louisiana, Cooperators William Shaw and J. J. Britton of the East Carroll-Madison Soil and Water Conservation District built a property-line lateral ditch between their farms. SCS Work Unit Conservationist W. B. "Shorty" Williams gave them guidance and technical help until the job was done. Today a fence doesn't separate their farms—a 1,200 foot ditch is the sign of their mutual interests.—JOHN M. CROSS, *Assistant to State Conservationist, SCS, Alexandria, La.* ♦



William Shaw (l.), J. J. Britton, and W. B. Williams, Jr., look at the ditch between the Shaw and Britton farms built with district-owned equipment.

Surveying Soils in Alaska

By Galen E. Kintner

Soil Scientist, SCS, Columbia, Mo.

EARLY in 1964, to step up soil classification in Alaska, the State conservationist selected eight soils men from the continental United States to make soil surveys in this rugged area.

I was one of those chosen to spend 4 months in the Susitna Valley in south central Alaska on this assignment.

Compared to most of the continental United States, surveying in this State differs in several ways: Living in tents, danger of wild animals, lots of mosquitoes, swift treacherous streams with few bridges, dense ground cover, few roads and trails—many of those impassable even with four-wheel drive trucks.

How to get there

We used many kinds of travel in addition to walking. Several streams that flow through the valley were used to good advantage. Operators who knew the swift streams were employed to haul us and our camping equipment in long, slim boats with powerful

motors to locations as far as 15 miles upstream from the end of the road where we remained for a week at a time. I spent several weeks in these remote sections where our most obvious neighbors were bear, moose, and salmon. We made other trips in float and amphibious planes, muskeg tractors, and by the Alaska railroad, the only Government owned railroad in the United States.

Regardless of the mode of transportation, getting the camping gear, personal effects, and food to these remote areas was always a problem. After some experience, our party soon learned that a checklist was necessary if we were to have all of the essentials for the entire week—food being the most important. Experience taught us, too, that food had to be protected from bears.

Our day usually began with the clatter of pots and pans made by the early risers. After breakfast, each soils man and an assistant prepared for the day's work. The aide packed a knapsack with the essentials for a day's hike and checked his high powered rifle. The soils man plotted the proposed

route for the day on an aerial photograph and checked his compass and other equipment.

Photos don't tell

Even though aerial photographs are a great asset, all landscape features are not visible on them. Streams are clearly defined, but their depth and speed were problems to be solved when we arrived on the banks. Fallen trees, many times hidden in dense undergrowth, made walking difficult as well as dangerous. As we walked through this wild, wooded terrain, we checked the kind of soil, lay of the land, and other land features, and recorded the information on the photographs.

These maps provide valuable information to prospective buyers, homesteaders, road contractors, and to people interested in future cities, airports, recreational areas, and many other uses. Because it is so difficult to get to these remote areas, soil surveys in Alaska can save people many difficult days' work in learning about the country.

A 3- or 4-mile hike usually found the sun directly in the south. Relaxing on the banks of a stream or sitting on a log completely surrounded by nature, made one forget about the difficulties of the morning's work, we discovered. If the bank of a stream was chosen as a lunch stop, fish were probably the topic of conversation. We wondered why the salmon battle the rapids and swift current just to spawn and die, and how they can find the same stream in which they were hatched after 3 or 4 years at sea? Bear tracks in the sand and partially eaten fish proved some salmon met an unforeseen destiny.

Lakeside snack

The shores of beautiful lakes made the noon snack an enjoyable experience. Moose were often seen feeding along the shores and some times swimming across the lake. Occasionally a black bear would be

seen eating berries or digging for ants in an old log.

By 5 or 6 o'clock with the sun still high in the sky, most of us found our way back to camp. Sometimes we met with more rugged terrain than we anticipated, or we failed to take enough compass readings. This meant "cold beans" for us.

After a discussion of the kinds of soil that we had found and a swapping of other interesting experiences, we ended the day with some form of recreation—cards, reading, or fishing.

As the adventures in the "land of the midnight sun" become only memories, hardships lose their edge, and a warm feeling remains for most of us—the quiet solitude and the unspoiled wildness that are Alaska. ♦

Recreation

(Continued from page 76)

appraisal will be a statement telling how much of each kind of recreation area *could* be developed in the district if warranted. The manner of stating the potential may vary according to the kind of recreation being considered and the specificity of the data.

Projecting demand

The third stage of program planning for outdoor recreation is an analysis of present and probable future needs for additional facilities. This is a market analysis and involves economic and social considerations. These needs are the portion of the undeveloped potential that should be developed in the near future to satisfy demand. For purposes of soil conservation district planning, a 5-year projection may be adequate. However most of the nationwide predictions of future needs have projected to 1980 or thereabouts. Districts may wish to follow this course and then estimate the rate of development of needs over the

15-year period.

Recreation needs reflect the interests and desires of people. Predictions of future needs will begin with present demand, increase it for population growth, adjust that for changes in character of the population (such as age groups, occupations, income level, etc.), and adjust it further for any discernable changes in use of time for recreation and tastes in types of recreation.

Two kinds of statistics are available which give nationwide information useful in making predictions of recreation needs. The ORRRC report estimated the increase in outdoor recreation activity from 1960 to 1976. The rate of increase should be roughly comparable from 1965 to 1980, and local districts could use the same percentages in their estimates. Thus, swimming might be expected to increase by 75 percent, picnicking by 50 percent, boating by 90 percent, camping by 88 percent, etc.

Trade associations and others have estimated needs for various recreation facilities for certain activities or areas by ratios of the population, such as: One 18-hole golf course per 25,000 people; swimming capacity to take care of 3 percent of the population at one time; 1 acre of public park for every 75 people in towns of 5,000-8,000; and the like.

Such general data may be adjusted for local use by exercising group judgment in comparing the local district with the "average" situation. The elements previously analyzed in appraising resource potential will be useful in developing these judgments.

Trends are clue

Information on trends in recreation participation may be obtained locally by using both statistical records and informed judgment. Operators of representative private and public recreation areas can supply informa-

tion. Those that have been in operation several years can describe trends they have observed. New areas may indicate changes in recreation desires of people.

Present desires of people for recreation can be estimated by group judgment of well-informed people. Park officials, chambers of commerce, secretaries, wildlife agency experts, soil conservationists, foresters, county agricultural agents, recreation trade association officers, sporting goods dealers, historians, resort and motel operators, and others can be helpful in arriving at sound estimates of local recreation interests.

A more precise method of determining peoples' habits and intentions in outdoor recreation is the interview survey, if based on a sound, scientific sampling of opinion by personal interview or mail questionnaire. It has two phases: (1) A survey of users of existing recreation facilities taken by interview at the recreation areas; and (2) a survey of the general population taken at homes, either by direct interview or by mail.

For certain kinds of recreation, local trends give adequate information; for others, State and regional trends are needed. For example, local information is all that is needed for field sports areas. But sound plans for developing vacation farms or guest ranches require information about trends over a wider area because of the greater distance people will travel to use them. Thus, adjacent soil conservation districts can profitably exchange information, and they may need some data from the State recreation planning agency.

With the information on present and future demand summarized, the next step is to relate it to the data on existing areas and potentials for development. For each kind of enterprise, the questions are: (1) How much will demand exceed the present supply, and

(2) how much of this unfilled need do we have resources to provide? Expressed another way, what parts of our undeveloped and underdeveloped resources should be developed for outdoor recreation in the years ahead?

Another important question is: What parts of these unfulfilled needs should be met by the acquisition of new publicly owned recreation areas and what parts met through private enterprise?

The answer to these are essential to program development and policy guidance by those concerned with the development of outdoor recreation locally. They are of

interest to soil conservation districts, county and municipal governments, and to local and State agencies having responsibilities for outdoor recreation.

The inventories and surveys involved may be handled in many ways with various of the concerned groups participating. Soil conservation districts are particularly suited to providing leadership in handling the inventories since they directly involve land and water resources. They have a great opportunity to be of public service by sponsoring and participating in these recreation inventories and their uses. ♦

Early Cooperator Still an Avid Fan

THEY'RE 22 years old, but John Buente still likes his terraces. "They'll stay there as long as I live," he says.

Buente, 1964 Farmer of the Year in the Vanderburgh County Soil and Water Conservation District, Ind., was one of the first cooperators in the first district organized in Indiana.

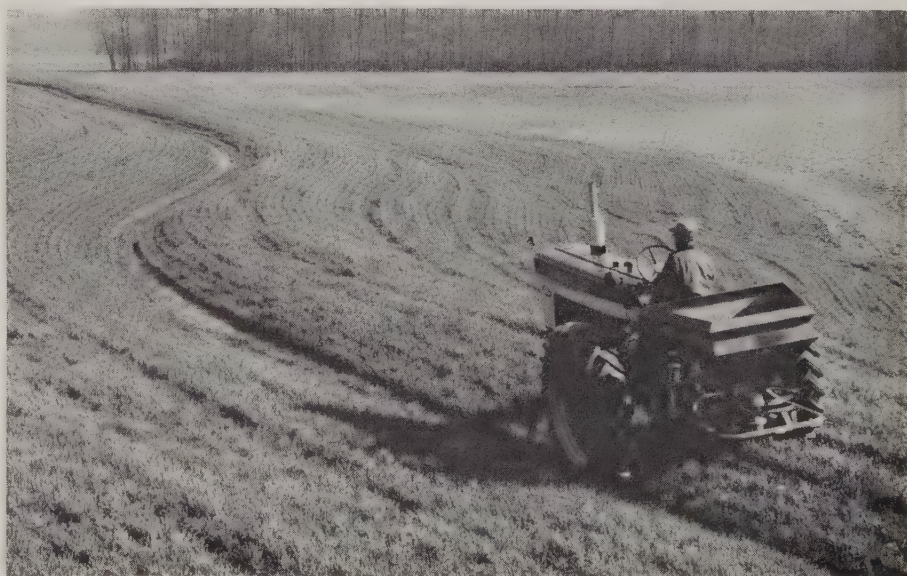
In 1943, Chairman of the new district, Christ Buente, a cousin of John Buente, talked John into letting the Civilian Conservation Corps install terraces and other

practices that SCS had recommended on his 160-acre grain and hog farm near Evansville.

What's the secret to successful conservation farming? John Buente says, "First off, you've got to figure out what practices you need on your farm. Then build what you need, and after you have everything built, keep it up."

His award indicates he is doing an excellent job of "keeping it up."—MILTON E. SPENCE, *Work Unit Conservationist, SCS, Evansville, Ind.* ♦

John Buente topdresses a wheat crop with nitrogen along his 22-year-old terrace system.





CONSERVATION PROFILE

Ben H. Feldewert

Missouri

Landslide starts farmer on conservation career

MOST Americans recall election day in 1936 as the biggest landslide in United States presidential history. But Ben H. Feldewert, St. Charles County, Mo., farmer and conservationist, remembers the day for yet another reason.

Feldewert recalls that Franklin Roosevelt's sweeping victory at the polls wasn't the only landslide that November 2. He saw the land slide right out of his fields under a torrential rainstorm.

"It really ditched my farm," Feldewert said. "The next spring we had to go in with a 2-horse plow to fill the ditches before we could harvest the wheat. That's when I started terracing."

Feldewert has been promoting conservation ever since. Besides being one of the county's first landowners to build terraces, waterways, and ponds, he was instrumental in organizing the St. Charles County Soil and Water Conservation District in 1944. He has been chairman of its board of supervisors ever since.

Feldewert later helped organize the Missouri Association of Soil and Water Conservation Districts. He also was in charge of a statewide conservation field day in St. Charles County in 1954. Just 11 years later the site for the field day is completely taken up in the urban development around St. Louis.

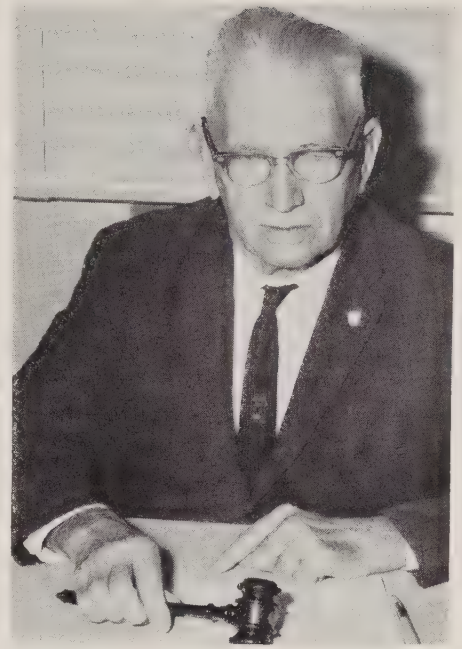
"Mr. Feldewert and his district have done a tremendous job in adjusting their conservation program to meet new problems as farmland is incorporated into suburbs," says Howard Jackson, SCS State conservationist for Missouri.

Realizing that city people could understand the farmer's conservation problem better if they knew more about it, Feldewert and his fellow supervisors were instrumental in organizing several programs aimed at conservation education and closer farm-city relationships. A conservation poster and scrapbook contest started in 1952 has helped thousands of St. Charles County seventh and eighth graders learn about conservation.

Feldewert was also prominent in inaugurating the first fish-for-fun contest in Missouri. Each spring the conservation district asks landowners to open their ponds to public fishing for two consecutive weekends. The program gives city people a day on the farm to relax and see conservation practices at work. It usually draws 800 to 900 fishermen, including women and children, many from nearby St. Louis.

Through Feldewert's leadership, the St. Charles District was first in Missouri to sponsor an annual meeting. The supervisors also publish the *Reporter*, a bimonthly newsletter. It won second place among new newsletters in the annual contest of the National Association of Soil and Water Conservation Districts last year.

In addition to his outstanding work in conservation, Feldewert has helped with many other activities. He has served as president of the O'Fallon school board and is now in his 16th year as a member of that board. He also serves as president of the 6-man St. Charles County school board, helps classify young men and review deferment applications for the local draft board and has served as chairman of the Federal Land Bank Association and as a member



of the fair grounds board.

This Missouri conservationist has been recognized by many groups. *Life* magazine featured him and his conservation accomplishments in a World War II issue. In 1947, he won the Skelly Award, a statewide honor. In 1950, he was honored for his outstanding contributions to conservation at a National Soil Conservation Field Day in Zeoring, Iowa. The *St. Louis Globe Democrat* also honored him that year for his conservation achievements. In 1962, his conservation district won the Goodyear Award, and he and another cooperator, Bernard Dyer, were selected to make the 4-day expense-paid trip to Litchfield, Ariz. He also received the Long Stride, Golden Step Award from the St. Louis Chamber of Commerce in 1962.

Feldewert was born July 25, 1893, on a farm in the same area where he still lives. He and his wife, Louise, are proud of their plantation home which was built in 1837, complete with pillars like Mt. Vernon. They have three children, John, who works with Ozark Airlines at St. Louis Municipal Airport; and Jeanette and Rosa Lee, who work at St. Joseph's Hospital in St. Charles. ♦



Consumers All: The Yearbook of Agriculture, 1965.

USDA. 496 pp., illus. \$2.75.

The 1965 Yearbook of Agriculture is a book of facts and basic principles needed by all citizens to make intelligent decisions about housing, home furnishing and equipment, finances, safety, health, food, clothing, and recreation.

Written for the "average" consumer, the book's 128 chapters contain very few technical terms and average less than 3,500 words in length. Yet, even the reader with some competence in a particular area will find valuable how-to-do-it tips in *Consumers All*. Excellent line drawings are used effectively to illustrate specific points in several chapters. It is a practical reference that could well be used daily in every American home.

The topics range from basic information on how to cook all types of meat to methods of sewing buttons on wearing apparel and from points to consider in planning personal and family finances to recreational-vocational opportunities in the study of nature. The contents generally were derived from bulletins and pamphlets published or in the process of publication by USDA.

The Soil Conservation Service contributed two articles: "Country Vacations," by Lloyd Partain, Assistant to the Administrator on Recreation, and "Nature Study," by Adrian C. Fox, Information Division, and Lawrence V. Compton, head biologist.

The 1965 Yearbook underscores the theme that the work of the Department, though primarily centered on services to farmers and ranchers, directly benefits all consumers. As Secretary Freeman points out in the foreword, \$2 of

every \$3 of USDA expenditures "are spent for services of primary benefit to all of us as consumers." In this light, it seems especially appropriate that USDA publish such a complete and handy reference designed for use by all citizens.—WALTER E. JESKE.

Organization and Methodology for River Basin Planning.

EDITED BY C. E. KINDSVATER. 1964. *Water Resources Center, Georgia Institute of Technology, Atlanta.* 561 pp., illus., maps, charts. \$5.

This book presents the proceedings of a 3-day seminar based on the study and report of the U. S. Study Commission, Southeast River Basins, held in November 1963 at the Water Resources Center of Georgia Institute of Technology.

More than 60 participants from colleges and universities, business, congressional committee staffs, foundations, State and Federal agencies, and members and staff of the U. S. Study Commission presented their various reactions to and appraisals of the recently completed study.

Some found much that was good in the study as conducted. Others placed emphasis on improvements that could be made should other studies be undertaken.

The frank reactions by informed and experienced people from many disciplines and with widely varied backgrounds make the book interesting to any one concerned with river basin planning. Although they don't sum up to a specific answer, they provide grist from which the reader can form his own conclusions.—GEORGE R. PHILLIPS, *Special Assistant to Deputy Administrator for Watersheds.*

Forest-Soil Relationships in North America. EDITED BY CHESTER T. YOUNGBERG. 1965. *Oregon State Univ. Press, Corvallis.* 532 pp., illus. \$8.

This book contains the papers presented at the Second North

American Forest Soils Conference held at Oregon State University in August 1963. It includes 35 papers by many authors, mostly from the United States and Canada. Subjects include: Detailed research of many kinds; methods of making soil surveys, soil-vegetation surveys, and classifications of forested lands; presentation of soil-woodland interpretations and examples of how soil interpretations are used in multiple-use management; and summaries of progress and procedures by industry and agencies dealing with soil surveys and their uses. Those interested in forest-soil relationships will want to consult this valuable addition to the literature.—PAUL E. LEMMON, *Soil-Woodland Specialist, SCS, Washington, D. C.*

New Publications

Water and the Land. BY BEN OSBORN AND PHOEBE O' N. HARRISON. 1965. *USDA SCS-TP-147.* 16 pp., illus.

Nearly everywhere there's a water problem—too little or too much, too soon or too late. But each is a local problem, understandable only against the background of local resources, economic development, and needs.

Updating the figures in and superseding SCS-TP-134, this publication summarizes the water problem and the water supply, use of water by plants and water for human use, sources of water, water-losses and water rights, and problems of too much water, and cites literature on the subject.

Soil Surveys

Waseca County, Minnesota. BY JOSEPH F. CUMMINS. 1965. 84 pp., illus.; maps 4 inches to the mile (1:15,840). Field survey by Carroll R. Carlson, Joseph F. Cummins, Russell J. Edwards, Grenfall F. Harms, Gordon Macvey, D. Kirk Woodworth, Halvor Ravenholt, and Leo G. Shields.

Jefferson County, Texas. BY JACK D. CROUT, DOUGLAS G. SYMMANK, AND GLENN A. PETERSON. 1965. 73 pp., illus.; maps 3.17 inches to the mile (1:20,000). ♦

From the Administrator:

International Cooperation



RESOURCE conservation and development is an important part of current worldwide efforts to improve the living conditions of peoples in all nations through international cooperation.

The Soil Conservation Service and the Department of Agriculture are involved in the work of several of the 28 committees carrying forward a program marking 1965 as International Cooperation Year.

Our concern for survival in this nuclear age naturally gives top priority to peacemaking and disarmament efforts. Our Government's policy of supporting the United Nations and its specialized agencies is well known.

Not so well known are our technical and economic activities, but it is in these fields that most international agreements are achieved. The extent of United States cooperation with other countries is indicated by the fact that our Government takes part in some 80 international organizations and programs and is a signatory to nearly 4,300 treaties and agreements now in force. About three-fourths of these were signed in the past 25 years.

Almost from the beginning of its existence, the Soil Conservation Service has actively assisted other nations in resource conservation by training specialists and students who come here to learn our methods and by providing professional people for foreign service when requested directly by governments or private companies or through the Food and Agriculture Organization of the United Nations and the Agency of International Development (or its predecessors).

The Soil Conservation Service has increased its activity in other lands notably in recent years. In addition to providing people for foreign assignments with other organizations, today we have soil conservationists, soil scientists, engineers, plant materials specialists, and other professionals serving directly in eight countries outside the United States.

Our main endeavor in these countries is directed to training local people in techniques of soil and water conservation that will benefit their agricultural programs. We hope that they in turn will be able to train their own people to carry out sound conservation measures.

My own experience in India, Turkey, and most recently in Costa Rica and El Salvador leads me to point out some of the problems that face our professional people overseas.

Most of the developing countries are hampered by severe economic problems, low levels of literacy, and often by long-established customs that run counter to good land use. The land occupiers generally cannot afford to own expensive modern equipment, so the work must be done with crude implements and handtools.

These conditions present a formidable challenge to technical people accustomed to working with the latest developments in agricultural technology. In their foreign assignments, they must adjust rapidly to local conditions and find simple ways of doing things needed to conserve soil and water and increase the productivity of land resources. Improvements come slowly, but any increase in yield and

quality of agricultural products help raise the standard of living of the individual and the nation.

Agriculture in any land cannot be sound without proper attention to the basic natural resources on which production depends. The Soil Conservation Service, and other agencies of the Department, are making a real contribution to world peace by helping other nations secure the foundations of their economic well being.

The job requires the efforts of the most capable and most dedicated people we have. A foreign assignment is not to be regarded as an opportunity for an extended vacation or gradual retirement.

Fortunately, our current arrangements with AID offer opportunities for energetic and ambitious conservationists of many specialties to sharpen their talents in foreign lands and make their contributions to international development without sacrifice of security or status in the Soil Conservation Service. In fact, such experience is a good way for employees to hasten their professional advancement in the Service.

The character of conservation work in the United States has changed a great deal in the past decade, with increasing attention to recreational and esthetic values of land rather than to commodity production. These are challenging concerns, but the results are largely intangible and often difficult to assess.

Our conservation missions in foreign lands bring our people face to face with the elemental necessities of survival and direct dependence on the land. They offer the same challenge to the pioneering spirit that we more frequently experienced in the early days of the conservation movement in America.

We are proud to be making our contribution to international cooperation in such a fundamental way.

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On-the-Ground Instruction in Conservation

Story on page 80



Sixth grade students in Douglas County, Wash., got on-the-ground instruction in conservation of soil, range, woodland, and wildlife on

a conservation field day tour led by supervisors from three conservation districts. Above, Al Young, SCS range specialist, explains how

overgrazing depletes native bunch grasses. The children also learned to identify several important range grasses.

DECEMBER 1965

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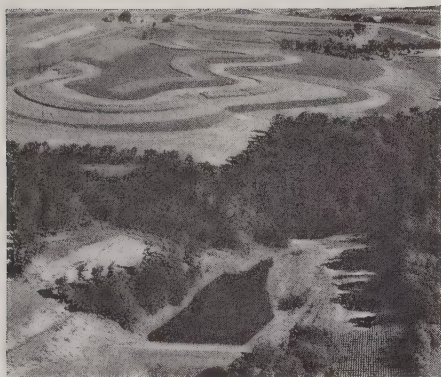
DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

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Terraces . . .

Modern farming, while shifting much land to noncrop uses, tends to intensify the cropping of that kept in cultivation. Erosion-control must be intensified accordingly.

Agricultural Engineer J. J. Coyle's lead article (p. 99) tells how SCS has kept conservation practice in step with production technology by modernizing terrace design and layout to fit today's larger machines.

Pedernales: It means "flint-rock"—the name of the river that has captured the Nation's fancy since the President epitomized his home country's history in his State of the Union message.

And it suggests the difficulties overcome in finding a harmonious way of using the land and making it bountiful and beautiful.

Our veteran Area Conservationist of the Pedernales Country, Dudley T. Mann, provided first-hand information about the land, people, and conservation efforts for our center-spread article (p. 107).

It is the story of all America's land, with the unique flavor of Texas' flint-rock country.

Roadside: Even ahead of the Highway Beautification Act, New Mexico moved, with SCS cooperation, to apply the new look to a section of interstate highway under construction (p. 101). Besides helping with the basic job of covering bare earth with grass, SCS plant materials men are starting tests of decorative plants to be included in the landscaping.

COVER: A water-control structure in the Coon Creek watershed, Wis., surrounded by woodland and terraced and stripcropped fields illustrates the combination of practices necessary for successful conservation.

Soil Conservation

Devoted to the wise use of land and water resources

DECEMBER 1965

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DESIGN in farmland terraces has evolved to provide modern farmers a basic framework around which effective soil and water conservation programs can be built.

In earlier days of the crooked old-style terrace and the short point row, farmers wished for the benefits minus the bother of terraces.

Today, parallel terraces as designed by the Soil Conservation Service and constructed and used by conservation farmers offer just that, along with a solution to the new problem of matching high-speed multirow equipment with terraces, diversions, contour rows, and other cropland conservation practices.

Combination needed

Satisfactory treatment of cropland subject to water erosion usually requires a combination of mechanical measures with the use of vegetation in conservation cropping systems, stripcropping, and crop residue management.

Reduction of runoff and control of water erosion are major problems for which these practices are developed.

The Conservation Needs Inventory shows approximately 179 million acres of cropland with water erosion problems, 70 percent of them in need of erosion control measures.

The severity of the problem is underscored by the fact that on many commercial farms row crop-

Modern Terrace Design

New systems for water erosion control make way for large machines on cropland fields

By J. J. Coyle

Agricultural Engineer, SCS, Washington, D.C.

ping is on the increase.

Experimental results in the Southeastern United States show that without preventive measures continuous row crops on a field with a slope of 5 feet in 100 can result in an average annual soil loss of more than 40 tons per acre. This loss is equal to 1 inch of soil in approximately 4 years. Under similar conditions but with a rotation of 1 year of small grain, 2 years of meadow, and 1 year of corn the average soil loss is reduced to about 4 tons annually.

Contour rows a must

Terraces and contoured rows are practically a must where row crops occupy the land a large part of the time. In all but the very low rainfall areas, waterways, or some form of handling water from graded terraces, are imperative.

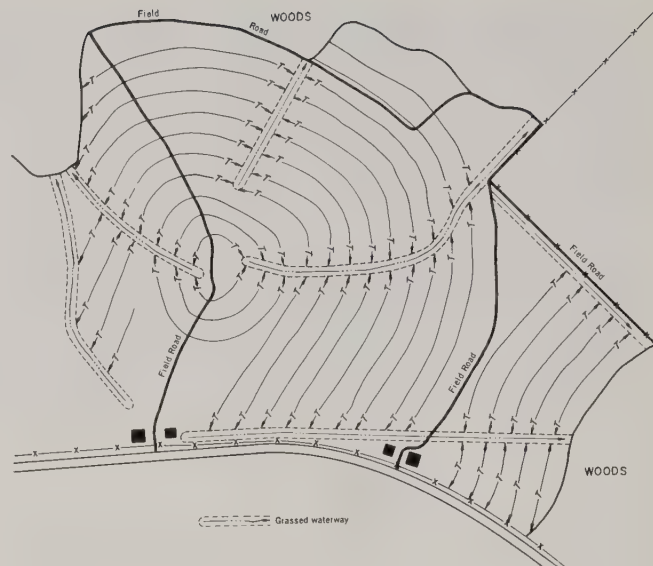
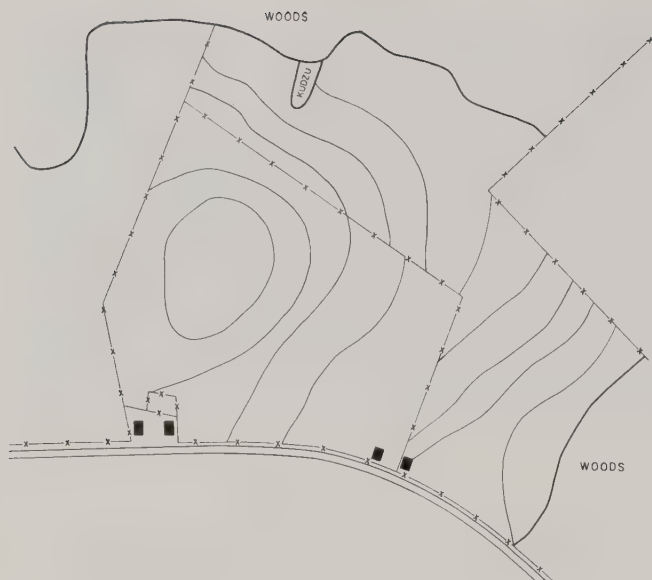
The volume of work required on this acreage is complicated further because water erosion control measures must be such that they

cause only minimum interference with large, fast-moving farm equipment.

The precision-built terraces of today are designed to accommodate farming equipment as well as to hold rainfall and let it soak into the soil. On some soils, it is possible to use terraces to impound all the runoff from each intervening drainage area.

Modern equipment requires terraces and diversions of such size that four to eight rows can be planted on each face of the terrace ridge. Where grassed waterways are needed, their side slopes must be flattened so that large equipment—mechanical cotton pickers, corn pickers, combines—can cross them without damage to waterway or equipment.

Another necessity, the farm road system, usually can be installed through careful planning with little loss of farmable area. Roads for movement of equipment were not so important in the days



Old (l.) and new (r.) plans on the same central Georgia farm illustrate the revolution in conservation planning to meet the requirements of today's farming. The new plan with parallel terraces provides a complete water-disposal system and makes every part of the field accessible by farm roads.

of horse and mule farming. Neither were they essential in earlier days of mechanized farming. But with modern large equipment, much time can be lost and much equipment damage incurred in moving it over the farm without a good farm road system.

The ridges and "hogbacks" in

A modern parallel terrace system on an Iowa farm uses pipe outlets instead of grassed waterways.

most fields are good road locations. Another location is along the back side of the terrace ridge where good drainage makes it very satisfactory for this purpose.

Grassed waterways should not be used as roadways unless they are made extra wide to provide room for travel outside the area that will be subject to waterflow.

Land use changes

Soil conservation engineers are finding they can work out satisfactory terrace systems except for cropland having irregularly undulating slopes. Success of their efforts is dependent on the farmer's willingness to adjust his land use to modern equipment.

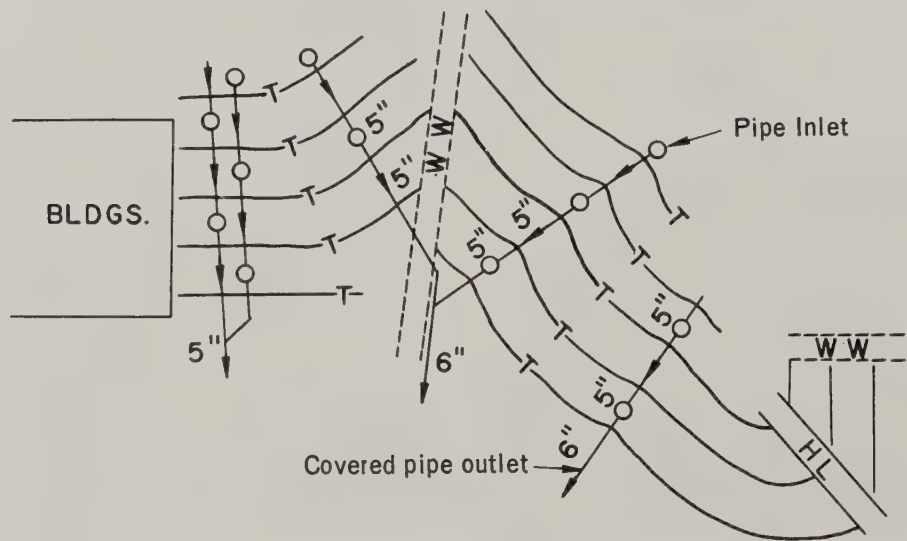
For the best terrace system, it is frequently necessary to remove from cropland use the rougher parts of otherwise good fields. Generally, the net results of such land use changes to the farmer is an increase in profits. The saving in time alone frequently more than makes up for the returns that would have been possible from the retired area.

Nearly 5,000 miles of parallel terraces were installed by soil and water conservation district cooperators in fiscal year 1965. This represents a substantial increase over the previous year and continues an annual acceleration that has been going on for the past few years. ♦

Scout Camp Gets Conservation Look

CAMP BOXWELL, the scenic Boy Scout facility on Old Hickory Lake in Wilson County, Tenn., is taking on a conservation look. Progress to date has brought the camp the USDA's Conservation Award for the Southeast for 1964.

"We are mighty proud of the conservation work that has been carried out so far, but this is just a beginning," Coleman Wright,



camp ranger says. The plan for the 950-acre area was worked out with the Wilson County Soil Conservation District. Wright gives credit for technical assistance to the Soil Conservation Service and the Andrew Jackson Chapter of the Soil Conservation Society of America.

Among the improvements is an Arboretum of pine containing 8 species, 200 trees each: slash, loblolly, shortleaf, longleaf, Virginia, sand, white, and Japanese black pine.

Across a grass waterway on a sloping field the Hardwood Arboretum has been started. Dogwood, sourwood, maple, oaks, and other hardwood species are growing.

One small field has been established to 10 different plots of perennial grasses and legumes. These plots along with the arboretums provide opportunities for the Scouts to learn plant identification. Many native plants and trees are also readily available for study.

Thirty-five acres of idle, eroded land has also been reforested with pine. Black walnuts have been planted along roadways and openings in existing woodlands.

Waterfowl areas have been developed on 40 acres of wetland and are already attracting "quackers and honkers." The improvements made on the wetland consist of a number of dams with the reservoirs planted to buckwheat, millet, and other foods for ducks and geese. These areas are flooded during fall and winter months.

Beef cattle graze quietly on the 100 or more acres of permanent pasture that has been established. Terraces and other water-control measures may be seen.

Camp Boxwell officials are pleased with the conservation progress. Roadside beautification and stabilization, woodland improvement, and landscaping are the next scheduled improvements.—A. K. BOOHER, *Work Unit Conserver, SCS, Lebanon, Tenn.* ♦

Roadside Seeding Project

New Mexico uses SCS plant materials and methods in first beautification effort

ROADSIDE BEAUTIFICATION is no easy task in New Mexico's foothill country where rainfall averages 16 inches a year, sometimes coming in torrents, and where the soils are highly erodible.

Soil Conservation Service and New Mexico Highway Department technicians will attest to that. They recently cooperated in the State's first project under the national highway beautification program along 3.3 miles of Interstate 25 between Glorieta and Rowe, in San Miguel County. A good stand of grass already covers the roadside embankments.

The project, which also will stabilize and conserve the roadsides and substantially reduce maintenance costs, involved grading, seeding with grass, and mulching 89 acres of highway rights-of-way.

Approximately 92 percent of the costs under the contract were paid

out of Federal highway trust funds and the remainder from State highway funds.

SCS provided technical assistance in developing plans and specifications for the \$26,000 project. An SCS soil scientist made a detailed soil survey on the project area which served as the basis for selecting grasses to be planted. SCS assigned an experienced plant materials specialist as adviser during the construction period.

Soil surveys showed that blue grama, western wheatgrass, and sideoats grama were the best species for seeding on the west portion of the project. On the sandier sites in the eastern portion, seeding was done with blue grama, sideoats grama, little bluestem, and western wheatgrass.

A few pounds of seed of native grasses from the Los Lunas Plant Materials Center, operated for

Interstate Highway 25 runs through arid country where seeding road cuts and shoulders is difficult. Native grasses were used on 89 acres along a 3.3-mile section of the divided highway.



SCS, was planted in addition to the contractor's seed at several locations by the New Mexico Agricultural Experiment Station to evaluate its potential in highway beautification and stabilization. Seed of 11 native and exotic plants also is being tested in the Interstate 25 project for possible use in future planting.

A standard grass drill, equipped with double disk furrow openers with depth control bands, was used in seeding most of the area.

Hay mulch was used to help conserve moisture and protect the soil from erosion. Nineteen truckloads of hay amounting to 223 tons were used. Most of the mulch was applied with a high-powered blower operating from the highway shoulders.

The hay mulch was punched into the surface of the soil to a depth of 2 to 3 inches to create an artificial stubble to protect the planted species during the critical time of grass establishment. It was necessary to anchor the hay mulch as soon as possible after drilling and applying the mulch to keep the soil loose.

Tests are being made at the Los Lunas Plant Materials Center to determine how native wildflowers may be added to the roadside plantings. The addition of trees and other woody plants to Interstate 25 and future roadside stabilization and beautification projects is being considered by SCS and New Mexico technicians. ♦



A standard grass drill (above) was used for seeding the slopes after grading and preparing a seedbed. Hay mulch was pressed into the soil to create an "artificial stubble" (below) to protect the new seedings. SCS technicians Glenn Niner (l.) and Archie Fuchs are pleased with the results.



Nineteen truckloads of hay were spread on the seeded areas with a blower mulching machine operating from the shoulders of the highway.





More Equipment Speeds Terracing In Southern Washington District

By Lucius W. Tilden

Soil Conservationist, SCS, Goldendale, Wash.

SUPERVISORS of the Central Klickitat Soil and Water Conservation District in southern Washington think they are on the move to meeting the needs of sloping croplands of their district for terraces, diversions, and waterways.

District records show that some 195 miles of gradient terraces were established in the district up to July 1965, and 3 to 5 miles are being applied each year.

Fairly widespread use has been made of stubble mulching, contour seeding, minimum tillage, and rotations including grass and legumes to retard erosion. But, as one district supervisor says, "These practices have helped, but we need more terraces, diversions, and waterways. We're still losing too much soil and water."

Floods show need

Heavy runoff during December 1964 and January 1965 caused serious erosion, sedimentation, and road damage and left the area without railroad service from late December until May 15. Even city dwellers saw the need for

better controlling runoff. To farmers, the floods pointed up their need to install terraces and waterways.

One factor affecting the amount and quality of terraces built has been lack of adequate equipment. Another factor is the short season during which soil moisture and weather conditions are right for terrace construction or where farmers have settled for lesser amounts or for terraces of lower capacity.

Supervisors of the Central Klickitat District decided to do

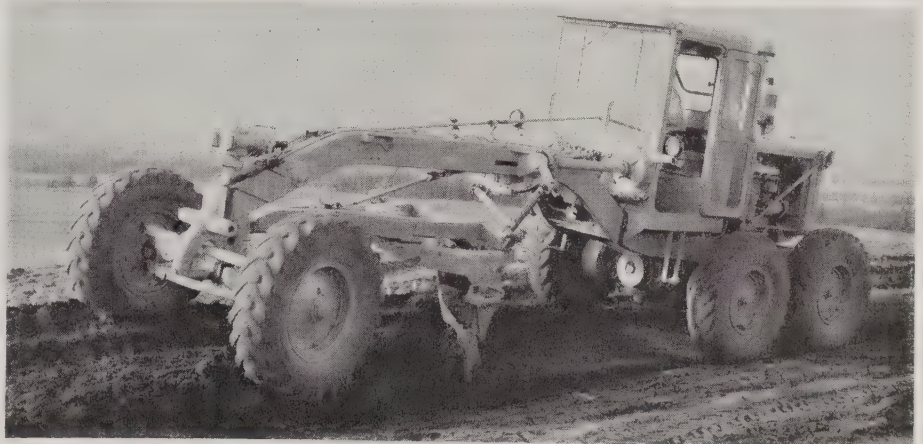
something about the equipment problem. A large versatile power grader run by a skilled operator appeared suitable for the job.

In this northwestern area, terraces often drift full of snow or clog with ice during the winter. A wide channel and good berm height are necessary to prevent overtopping when spring thaws occur. The supervisors, therefore, believed they needed equipment capable of building large terraces.

They also thought that more terraces would be built if a contractor were available to do the work when conditions were right and without interrupting the farmers' own seasonal operations.

The district supervisors and SCS Technician Duane Lewis urged local contractor Ed Doubravsky and others to buy a suitable grader and make it available for conservation work. The super-

This large motor grader, building a terrace on the Cora Richardson farm near Goldendale, Wash., does the job faster with fewer trips.



visors and those of the Eastern Klickitat District also met with the Klickitat County commissioners and worked out an agreement whereby county equipment could be obtained for conservation work when private equipment was not available.

Grader does the job

Doubravsky acquired a motor grader in April. His first job with it was on the Cora Richardson farm, operated by Claude Knight. Here Doubravsky finished some terraces that had been staked and plowed out in October 1964. The resulting terraces were large, well shaped, and packed.

Another job was for Anthony "Tony" Sarsfield on his farm near Warwick. About 3,440 feet of terraces were constructed in 27 hours and approximately 2,600 feet of waterway shaped in another 5 hours at a cost of \$12.50 an hour. Tony was pleased with the results as well as the cost and said, "I didn't have either the time or the equipment to do the job myself."

In this district, use of a moldboard plow and dozer or a small pull-type grader for terrace construction has cost farmers \$100 to \$150 per 1,000 feet of terrace. In addition, two men were often required to do the job. Often the farmer was "tied up" at a normally busy season.

Using the motor grader and a skilled operator frees the farmer for other jobs and appears to produce a better terrace at no greater cost. In another district where many terraces have been built using motor graders, an average cost of \$90 per 1,000 feet has been established. Tony Sarsfield's costs compare well with this figure.

Supervisors of the Central Klickitat District see there is still a conservation job to be done, and their efforts and encouragement are speeding its progress. ♦

Students Take an Interest in Pond They Had a Hand in Building

WORK Unit Conservationist Charles E. Davies is sure the fifth graders of North Elementary School in Brighton, Colo., have a special interest in Mike Tashiro's big pond. They helped with the building of it.

Tashiro, a conservation farmer in the West Adams Soil Conservation District where Davies works, recognizes their contribution. In appreciation, he plans to let the youngsters enjoy fishing there.

According to Davies, this is how it was—

Mike Tashiro raises vegetables—peppers, onions, sweet corn, and cabbages—for the Denver market. He needed the pond as a cushion against emergency need. It holds water for times when the regular supply, from ditch or the wells, may fail. The ditch supply has been known to fail in dry years, the pumps on the wells can break down or the power fail. Tashiro can fill the pond at night and during rainy spells and use the water when he needs it.

The Tashiro farm is one of the

places where teachers regularly bring groups of pupils to see soil and water conservation being done. Principal Richard Clark of North Elementary, for example, is a firm believer in out-of-doors learning. The school superintendent, Mrs. Bertha Hyde, and the other principals in that area agree. Mike Tashiro likes to have them come to see conservation in action.

There was action that day during the building of the pond. The excavation and shaping were finished. Everything was ready for the placing of sheets of plastic to keep the water from seeping out. Using the plastic for such a purpose was new in the area. But Soil Conservation Service engineers were sure it would work. Just then Mrs. Margo Sack and her fifth grade class arrived on one of their scheduled outdoor study sessions. When the first sheet of vinyl was unloaded the pupils helped to tuck the edge into the anchor trench. Mrs. Sack then placed the first shovelful of backfill earth. Then the pupils took places along the

A small grader is used to roll earth onto the plastic liner to seal the pond bottom.





Mrs. Margo Sack, fifth grade teacher, does the honors (l.) with the first spadeful of dirt as her class volunteers to help place the plastic liner in the Tashiro pond. Members of the class help (r.) secure the first sheet of plastic in trench above waterline of pond.

roll of plastic and gently unrolled it as workmen tossed enough earth onto its surface to anchor it until the earth blanket could be pushed onto it by machinery.

When the first 60-foot sheet of plastic was in place, the pupils saw how the edge of the second sheet was overlapped on the first about 6 inches and fastened with cement.

Tashiro stocked the pond with fingerling trout last year. The fish are a good size for catching now. But one thing is certain: Tashiro says only children of grade school age will fish for them. Dads may come along to help the extremely young visitors bait hooks, but that's as far as grownups can go. This pond, which the youngsters helped to build, will be a fisherman's dream of course.

It is safe to assume that the new generation in the West Adams District, enjoying the body-sustaining foods that make vigorous, alert, grownups, will have a lifelong awareness of the role of soil and water—and their conservation use—in the building of a strong and beautiful America. ♦

Tulips Add Novel Splash of Beauty To Louisiana Watershed Project

By John M. Cross

Assistant to the State Conservationist, SCS, Alexandria, La.,

WHEN the Tensas-Concordia Soil and Water Conservation District in Louisiana's Mississippi River Delta set out to get approval for the North Tensas watershed, they put Ed McDonald, Sr., on their team. It was thought his experience as a landowner, businessman, conservationist, and prime mover would make success a certainty. It did.

An unexpected bonus was a dash of beauty not often found in a watershed project. When the contractor moved away from the fourth and final job on more than a hundred miles of new channels, beds of tulips were sprinkled far and wide across the landscape—thanks to Ed McDonald, "The Tensas Tulip Man."

Not satisfied with the grass, the tall timber and the fields of waving grain, McDonald headed a tulip-planting campaign.

Where small landowners of moderate means were reluctant to invest in the bulbs, Mr. Ed donated them. Small islands of tulips and other flowers dot the long stretches of cultivated fields. Mailboxes seem proud to stand tall in the splashes of color. More than a million tulip bulbs have been set, most of them in the North Tensas watershed.

On his Durosset Plantation, just off the Great River Road, McDonald has converted an old dairy barn into a "bit of old Holland." Around it are 12 acres of gardens, splashing color almost beyond description.

"Louisiana Dutch" maidens serve as hostesses in native costume. Tulips, anemones, ranunculus, and jonquils start the blooming season, and it is kept alive with a chain of flowers on into summer and fall. More than 250

flowering shrubs form the backdrop.

McDonald will be the first to say he did not do this job alone. There was George Bagley, a supervisor of the district, and his live-wire wife, Barbara, and District Attorney Tom Clark, County Agent Charles James, Soil Conservation Service Work Unit Conservationist James Barbre, and a host of others.

Before a shovelful of earth ever was moved in the watershed McDonald could see the end of floods that had been sweeping away the beauty and the bounty of Tensas Parish. He saw miles and miles of fresh water fishing. He saw vast expanses of green grass on land that had not been paying the taxes because it was subject to flooding and not used. He saw herds of deer grazing on food plots planted just for them.

When McDonald wandered into Tensas Parish from Florida back in 1920, great potential was evident to him in the rich, Mississippi alluvium soil. From his first job with an elevator he has built a

prize herd of cattle, and a gin and elevator of his own—or in partnership with his sons.

The flood of 1927 just a few short years after his arrival failed to dampen his spirits. Regular inundations since then have only made him more determined to lift his parish out of the mud.

With help from the Soil Conservation Service, teamwork with soil and water conservation districts and a lot of other folks, he settled the problem through Public Law 566.

An ardent conservationist, he served 7 years as chairman of Louisiana's Wild Life and Fisheries Commission. He has served many years on the Tensas Parish Police Jury (governing body), worked for a hospital building and has been a leader in other community efforts. Recently he was appointed to the State Agricultural Stabilization and Conservation Committee.

During the 1927 flood he and his neighbors took food by boat to a little herd of deer marooned on a high spot, and the parish now

has deer everywhere.

Recently Ed McDonald was honored by the Dutch Government for his contribution to international understanding. Later there will be an international cultural exchange initiated by him whereby students from Holland will come here to study.

"None of this would have been possible without the North Tensas watershed," says Mr. Ed. ♦

Engineering, Crop, Soil Societies Meet

The American Society of Agricultural Engineers (ASAE) held technical sessions on soil erosion, irrigation, hydrology, and drainage at its winter meeting, December 8-19, in Chicago, Ill.

On December 6 and 7, the ASAE, Soil Conservation Society of America, the International Commission of Irrigation and Drainage, the Crop Science Society of America, the Soil Science Society of America, the Botanical Society of America, and the American Society of Civil Engineers sponsored a conference on "Drainage for Efficient Crop Production."

These meetings brought together many of the leading scientists in engineering, soil science, and botany, who have an interest in drainage. ♦

Conservation Research Reports

A new series of the Department of Agriculture publications makes available semitechnical or technical information resulting from research directed toward the conservation of renewable natural resources. Included in this category are reports of conservation research and reports on less complete research projects than are reported in the technical bulletin series. This new series is now in effect and is available for use by any agency for manuscripts meeting the series criteria. ♦

Ed. R. McDonald, Sr. (l.), ardent conservationist, tells George R. Bagley how Dutch Gardens got started in Louisiana's North Tensas watershed. Bagley is an SCD supervisor.





"But men came and worked and endured and built . . ."

In the Pedernales Watershed

It was once barren land. The angular hills were covered with scrub cedar and a few live oaks. Little would grow in the harsh caliche soil. And each spring the Pedernales River would flood the valley.

But men came and worked and endured and built.

Today that country is abundant with fruit, cattle, goats, and sheep. There are pleasant homes, and lakes, and the floods are gone.—President Lyndon B. Johnson's State of the Union Message, 1965.

LESS than a century and a quarter ago, the land along the Pedernales River was rugged, rocky, raw country, ruled by warring Comanche Indians.

It was the land of the mountain lion, black bear, coyote, rattlesnake, and earlier the buffalo. It was also a land covered with tall grasses and scattered small trees and native shrubs that supported the wild game and absorbed the erratic and sometimes violent rainfall.

The Pedernales watershed of approximately $\frac{3}{4}$ million acres lies across two counties, Gillespie and Blanco, in the Texas "Hill Country" west of Austin. The river joins the Colorado near the Balcones Escarpment about 25

miles upstream from Austin, a rugged ledge of limestone marking for 200 miles the eastern edge of the Edwards Plateau and visibly separating the ranching West from the farming East.

Indian domain

The game-rich hills and spring-fed canyons of the Hill Country remained the domain of the Indians while Anglo settlers tamed the woodlands and prairies east of the escarpment and the young Republic of Texas established its thriving urban capital at Austin.

The early Spanish explorers and the Mexican missionaries of the Eighteenth Century left little trace on the land, save for a few place names, like "Pedernales." The name seems to have evolved from the word "pedinal," which means "flint rock." It was an apt choice for a stream that flowed over cherty limestone beds through a country where Indians left many mounds of flint rock fragments

Sturdy pioneers colonized a harsh country; today their sons improve the land's resources

from making arrowheads. The word gradually changed to "Pedernales," and now the accepted spelling is "Pedernales," although natives of the area more often pronounce it "Perdenales."

This was the country as seen by the first permanent white settlers in the years just before the Civil War. The story of its settlement and conquest, its reaction to too intensive uses, and the constructive efforts of today's citizens to preserve and improve its resources is the common story of the American land—but with details peculiar to the character of the area and its people.

Two conservation districts

Two soil conservation districts now include the Pedernales River watershed, with boundaries that coincide with the two counties previously mentioned. More than 75 percent of the land owners and operators are cooperating in planned conservation programs, in-



The Pedernales River winds its way through the picturesque Texas Hill country. Dam in foreground serves as a roadway.

Under good management, tall range grasses thrive on a conservation ranch, recreating a scene such as greeted the first settlers.

Each was allotted a small tract of land in or near the town and a larger one farther out. They worked together to build their first houses of logs and planted crops on their country places.

Being traditionally inclined to build permanent structures, they soon began quarrying limestone from the surrounding hills. The work of the skilled stone masons still stands as a part of many of the buildings in modern Fredericksburg.

Baron Meuseback soon gained the confidence of the Indians, and in 1847 he made a treaty with the chiefs establishing the San Saba River as a boundary between Indian territory and the settlement. This made it possible for the settlers to spread out with farming and ranching interests. Gillespie County, with Fredericks-

cluding President Johnson on his famous LBJ ranch in the Gillespie Soil Conservation District and other land in the Pedernales Soil Conservation District.

Permanent agriculture began in the Pedernales country when a colony of German immigrants under the leadership of Baron John O. Meuseback founded the

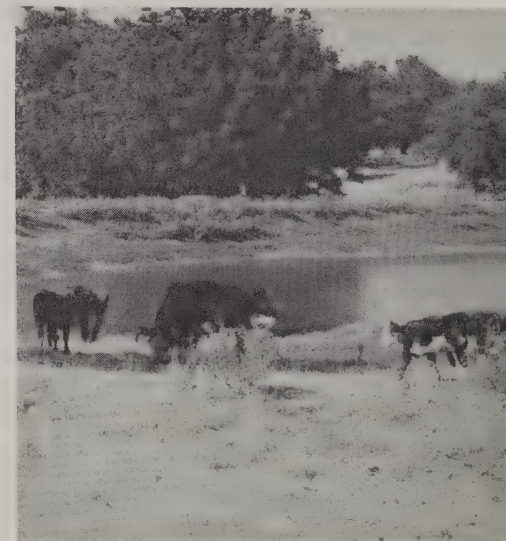
town of Fredericksburg between two tributary creeks in 1846. Supplies that were supposed to reach them before the first winter failed to arrive and the colonists suffered extreme hardships and many deaths.

The colony included highly skilled craftsmen in most of the trades to make it selfsupporting.



Recreation is a byproduct of this ranch pond constructed to provide water for livestock.

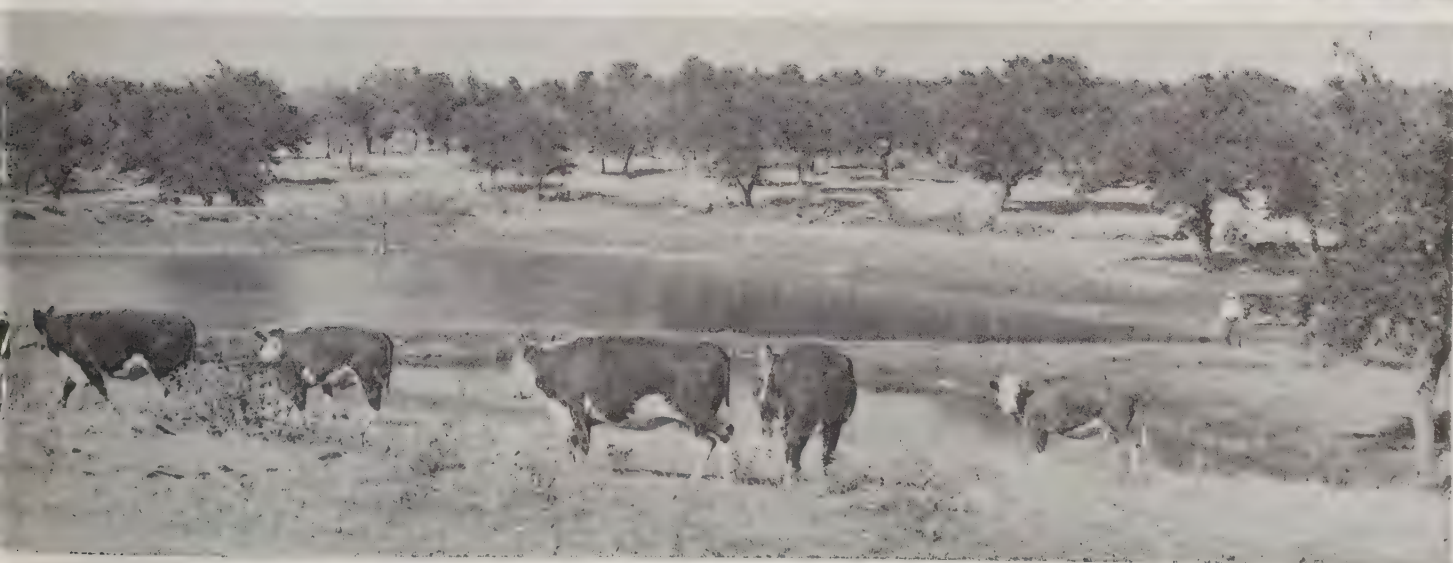
Numerous ponds dot the upland ranges, providing water for livestock and holding back runoff water from the valleys below.





Goats are grazed in combination with cattle, sheep, and deer on the same range.

abound on the brushy range and a major source of income to many farmers.



burg as the seat, was organized in 1848.

Meantime, venturesome pioneers from the East, including the President's grandfather, Samuel Ealy Johnson, and his brother Tom, were raising cattle in the hills downstream and trailing them to Kansas markets. Settlements sprang up at scattered points along streams, and Blanco County was organized in 1858. Johnson City became its county seat.

As the settlers harnessed the land for agriculture, they concentrated their cultivated fields in the stream bottoms and on sandy soils easy to till with simple horse-drawn tools.

After a period of subsistence farming, cotton was the early cash crop of the area. At one time 20 cotton gins operated in the 2 counties. Today only a few acres of cotton are planted, and all the gins are abandoned. Farmers learned that the clean-tilled crops robbed the soil of organic matter and hastened erosion. They switched to small grains, grain sorghums, and perennial grasses that offer more protection to the soil.

The early settlers let their cattle roam the range along with deer and other wildlife. The animals thrived on the tall native grasses.

Gradually, the settlers built rock fences, increased the size of their herds, and confined them to



Carlos Grote, supervisor of the Pedernales SCD, inspects an excellent growth of grass after removal of cedar from a brush-invaded range. Oak was left for wildlife food and cover.

certain areas. Later they brought in sheep and goats and put up wire fences.

Heavy grazing by the livestock and wild game thinned out the tall native grasses. Thick growths of brush, such as cedar (juniper) and oak, closed in, taking sunshine and moisture from the grasses and cutting forage growth sharply.

Then, hard rains sent heavy runoff down the slopes, cutting gullies, scouring away the shallow topsoil, flooding bottom lands, and clogging streams with mud.

This was the land the President knew as a boy after the turn of the century—"barren . . . , covered

with scrub cedar and a few live oaks . . . ; little would grow in the harsh caliche soil."

Today new generations of farmers and ranchers are learning to respect the limitations and understand the potentials of this peculiar land. Cooperators with the soil conservation districts, following the guidance of soil maps in their conservation plans and their own experience, have converted most of the shallow-soiled upland fields to grass and shifted to sown crops. The bottom-land fields are protected by needed conservation practices.

They are removing or thinning

Continuous row-cropping led to serious erosion (l.) of the sloping upland fields put into cultivation by the early settlers. Today's conservation farmer uses sown crops and sorghums in contour strips (r.) and other soil-saving practices.



the unnatural growths of brush on their rangeland and giving the grasses a chance to grow again. With better understanding of the requirements of the plants and the potentials of different range sites, they are managing the grazing of livestock to rebuild the water-holding blanket of grass their forefathers found on the rocky hills.

A chain of lakes

On the mainstem of the Colorado River above Austin, the Lower Colorado River Authority has built dams creating a chain of lakes—Travis, Marble Falls, Granite Shoals, etc.—where the President enjoys boating on his visits home and where thousands of local people and tourists gather for fishing and water sports.

The floods are indeed gone from the main stream, but upper tributaries still overflow when the occasional cloudburst dumps more water on the land than the shallow soils can hold.

The people along Williams Creek, a tributary of the Pedernales River below Stonewall, have applied for a small watershed project under Public Law 566. The work plan proposes flood-prevention measures to protect the bottom-land area around Albert.

Major overflows occur on the Pedernales at irregular intervals of 10 to 15 years, the most recent in June 1965. The Gillespie County Water Control and Improvement District and the Gillespie County Soil Conservation District jointly plan and encourage water-control measures.

The two conservation districts cover about 704,000 acres. Of this total, about 615,500 acres, or 87 percent, is rangeland and 77,500 or 11 percent is cropland. Miscellaneous and urban areas make up the remaining 11,000 acres.

Beef, mutton, wool, and mohair provide the principal agricultural income of the area. Wheat, oats, grain sorghums, and forage sorg-



Truck crops are becoming more important in the local agriculture. Helmuth Klinksiek, a cooperator with the Gillespie County SCD, picks a crop of bell peppers.

hums are the main agricultural crops. Peach orchards are becoming more important. Hunting leases also are an important part of many ranchers' income.

The Texas Parks and Wildlife Department, soil conservation districts, and other groups help landowners develop and manage their wildlife resources. Plans include increasing forage production for wild game and domestic livestock, improving the habitat for wild turkey and quail, and improving deer hunting arrangements.

Among the practices applied by the cooperators of the two conservation districts are: Brush and weed control on rangeland, 125,000 acres; deferred grazing, 332,000 acres; proper range use, 388,000 acres; conservation cropping system, 59,600 acres; contour farming, 49,800 acres; crop residue use, 58,000 acres; diversion terraces, 593,000 feet; terraces, 6 million feet; and 523 farm ponds.

The entire Hill Country long

has been attractive to tourists because of its mild climate, natural beauty and ruggedness, excellent deer hunting, friendly people, tasty foods, historic sites, interesting architecture, and its nearness to Austin and San Antonio.

Since Lyndon Baines Johnson became President, national attention has been focused on his "home country." Tourists constantly pour into the area to get a glimpse of his LBJ Ranch, his nearby birthplace and first school at Stonewall, and his boyhood home in Johnson City.

Jet planes and helicopters today shuffle important people in and out of the Pedernales country where once the stagecoach was the main means of transportation.

The people are putting increasing emphasis on developing the natural resources of their area. They believe that theirs is a land of great potential and promise and they are working steadily to achieve their goals. ♦

Beauty and Recreation Are Bonus Benefits in Iowa Watershed Project

By C. Warren Curtis

Work Unit Conservationist, SCS, Logan, Iowa

IF serendipity may be defined as unexpected good fortune while in pursuit of a goal, then the small watershed program is full of it. For, quite often, the side benefits from a watershed project equal or outweigh the main purpose.

Such was the case with the Dunlap subwatershed of the Mill-Picayune Creek Project at Dunlap, Iowa. The project's contribution in restoring natural beauty to the area has stimulated new community pride in the town's 1,250 residents. And the creation of a small lake has greatly enlarged local recreation opportunities.

Unexpected dividends

These were both bonus benefits that will pay dividends for years to come.

The primary goals of the project sponsors were to reduce periodic damaging floods and eliminate the town's eyesore—a deep gully that cut across the south edge of the community.

Aggravated by uncontrolled runoff over the years, the gully got bigger. It became a rat infested dump yard in dry periods and a mosquito breeding ground in wet years.

In 1959, Dunlap residents saw a solution to their problem in the Small Watershed Program (Public Law 566). Work on the plan went ahead well, and in June 1960 Congress approved the project. Plans called for conservation measures on the uplands and a watershed dam above the town to afford a high degree of flood protection.

But 3 years elapsed before the dam was built. Getting the necessary easements and rights-of-way

was a bigger task than many had realized. The project sponsors—the town of Dunlap, Harrison County Soil Conservation District, Harrison County Board of Supervisors, and Iowa Highway Commission—had to obtain easements from 39 individual landowners.

It was during this time that some townspeople had misgivings about the project. These proved to be unfounded. The easements were obtained and the city purchased a 43-acre tract of land above Dunlap for location of the flood-retarding dam.

With completion of the dam, the unsightly gully was cleaned up,

grubbed out, reshaped, and seeded as a waterway. Six old wooden bridges that spanned the ditch were replaced with low maintenance metal culverts.

Beautification

Dunlap Mayor Leonard Jacobsen said, "That waterway is just like a carpet of grass." He voiced the views of many Dunlap residents when he said, "We have a wonderful start here toward making Dunlap the best groomed community around."

The mayor feels the project will encourage many individual property owners to take on beautification campaigns of their own.

And recreation

With the threat of floods and the ugly ditch behind them, the townspeople have shifted their interest to the watershed dam and the 9-acre lake behind it. The dam construction took 81,153 cubic yards of earthfill. It is 45 feet

Community leaders meet by the concrete inlet of the flood-retarding structure to discuss recreation plans for the 9-acre lake. They are (l. to r.) Louis Culver, chairman of district commissioners; Leonard Jacobsen, mayor of Dunlap; LaVerne Wertz, president of the Lions Club; Warren Curtis, work unit conservationist, SCS; and Calvin Leader, president of the Booster Club.



high, 525 feet long, and has a 100-foot-wide emergency spillway.

The municipally owned lake and adjoining 34 acres of land form the foundation for a new recreation area. Access roads, picnic sites, boat dock, and rest rooms will be built. The Fish and Wildlife Service has stocked the lake with 1,000 largemouth bass.

In addition, there are plans to use the recreation areas as an outdoor classroom for teaching conservation.

Much credit for the project is attributed to Louis Culver, chairman of the Harrison County District, and owner and operator, with his son, Jerry, of a 450-acre farm east of town. Culver is a member of the Iowa Natural Resources Council, a member of the Governor's State Recreation Board, and a member of the Western Iowa Experiment Farm at Castana.

Citing benefits of the watershed project, Culver said that property values have gone up, and several new buildings have been constructed.

Wildlife habitat has also improved. Earl Weber, landowner in the subwatershed, said, "The number of pheasants on my farm has increased tremendously since the deep gully was pushed in and seeded to alfalfa and bromegrass." He also said he has sighted as many as 12 to 15 mallards on his pond at one time, where he'd never before seen a single wild duck.

Among other benefits from the project are reduced gully erosion on agricultural land, reduced erosion damage along the highway, lower highway maintenance costs. These benefits alone are estimated to be worth \$4,150 a year.

What did the project cost? The Federal Government's share was \$85,777 for the dam and needed work on the ditch. The local costs included the easements and rights-of-way, land for the reservoir, and the costs of the culverts and their installation. ♦

A Soil Survey in Hawaii

By Carl W. Guernsey

*Assistant in Agronomy, University of Illinois, Urbana, Ill;
formerly Soil Scientist, SCS*

THIS HOOSIER soil scientist never fell out of a pineapple field during 14 weeks of soil survey work on the Island of Maui, Hawaii, but it would have been easy to do. It was a new experience to look out the window of a laboring jeep to see pineapple plants on one side and the edge of a 3,000-foot gulch on the other.

Pineapple industry

I was there in response to a request from the Maui Pineapple Company, through the West Maui Soil and Water Conservation District, for assistance in solving soil conservation problems on its pineapple land. This company is the only pineapple producer on West Maui. The plantation management is aware of the usefulness of a detailed soil survey not only in design and installation of conservation practices but to help solve disease, fertility, and crop adaptation problems as well.

Like all islands of the Hawaiian group, Maui is of volcanic origin and is mountainous. It shares with other islands the low proportions

of potentially arable land. This low proportion is all the more striking when one sees the intense efforts to use each acre profitably. For someone whose experience is primarily in Midwestern U. S. A., the concept of soil is broadened when he has an opportunity to see how the large industrial farms are using it.

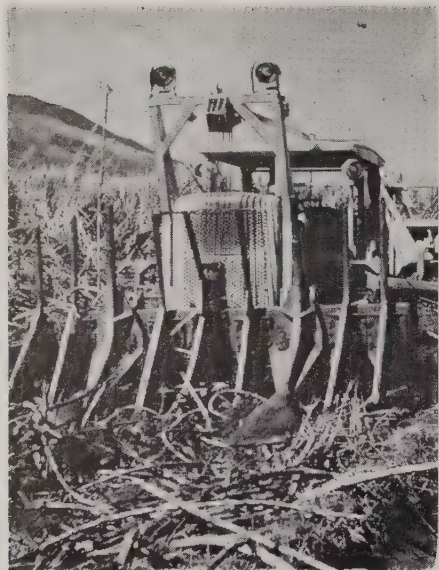
Agricultural assets

The biggest agricultural assets of Maui are the year-round growing season and the availability of water. The soils themselves are not particularly fertile, although many of the red soils do have desirable qualities such as good natural drainage and a high degree of resistance to erosion. But most important are the available water, sunshine, and the temperature which seldom falls below 60 degrees in agricultural areas.

The Pineapple Research Institute (PRI) conducts research for the Maui Pineapple Company and for all pineapple producers in

Intense storm in 1961, yielding 25 inches of rainfall in 36 hours, caused severe gully erosion in pineapple field.





The plantation constantly studies new cane production methods. Push rakes (l.) remove several tons of soil an acre during each sugarcane harvest. For sugarcane irrigation at lower elevations (r.), well-designed reservoirs store water from high rainfall areas. Pineapple in background needs no irrigation because of its low water requirements.

Hawaii under a plan in which each producer contributes an annual sum of money to the PRI research fund, along with a list of research needs. Research data and interpretations from these joint projects are then made available to each producer.

The PRI conducts research and makes data available to producers on a continuing basis. It is constantly trying to tie its research to defined kinds of soil so that data and predictions from the research can be applied over the widest possible area.

Soil maps and legends prepared by the Soil Conservation Service are thus a useful tool to enable pineapple producers to make maximum use of research information furnished by the PRI.

Survey procedures

In organizing the survey the soil survey leader decided that the party needed some pits for soil classification and correlation. The pineapple company furnished plantation laborers to dig 15 pits and offered to give any additional help needed.

The survey party then met with the plantation manager and his staff to explain soil survey

methods and procedures and asked them to furnish information on production problems experienced in different fields. When the survey was completed, a field tour was held to explain the soils and soil maps and to see and discuss representative soils in the field.

Plantation soils

Soils mapped on the plantation were currently classed as Low Humic Latosols, Humic Ferruginous Latosols, and Humic Latosols. A predominant reddish-brown color, high clay content, relatively high organic matter content, high infiltration and percolation rates, and strong resistance to shear are characteristics shared by soils in these three great soil groups.

Determining the actual proportions of clay in these soils is difficult (clay as used here refers to very fine mineral particles). In the laboratory it is almost impossible to get soil samples completely mixed with water and dispersed so that the clay can be accurately measured. As a result, many of the clay particles remain grouped together into small aggregates of silt size and are not measured as clay. Even so, analyses give figures of 50 to 70 percent clay

for many of these soils.

This tendency of the clay particles to resist wetting and to remain grouped into silt-size particles also makes it difficult for a soil scientist to determine the soil texture in the field.

The strong resistance to shear exhibits itself in banks and road cuts which stand vertically with minor slumping, sliding, or sloughing; it has a practical importance to agriculture because it imparts stability to the soil mass and thus prevents detachment of individual soil particles in the first stage of the soil erosion process. Resistance to shear becomes apparent indeed when one attempts to use a "sharpshooter" spade to dig a pit for field study!

Organic matter is high in comparison with light colored soils of the Midwestern United States. Moreover, it is distributed rather uniformly throughout the top 3 or 4 feet of the soil rather than being concentrated in the surface layer. Few Low Humic Latosols have less than 3 percent organic matter, while the figure may rise to 8 percent for Humic Latosols.

Infiltration and water percolation rates for these soils are apparently high. While few data are

available to bear this out, the very low volume of runoff during and after a heavy rain can be qualitatively measured by onsite observations. The small amount of rainfall that does run off is often clear, or nearly so, even in freshly tilled fields. Infiltration and percolation rates, 3 to 10 times the average rates of soil in the Midwestern United States, seem probable.

Soil features

Soil features new to this Hoosier soil scientist include: (1) The concentration of manganese dioxide (MnO_2) in the Low Humic Latosols, (2) the differences in bulk density of some soil layers in Humic Ferruginous Latosols, and

(3) the extent to which extremely stony soils are being used for sugarcane production.

Striking features of the soil survey program on West Maui include: (1) The great emphasis placed on complete descriptive legends by the survey leader, (2) the high degree of appreciation and understanding of the survey by management personnel of the sugar and pineapple plantations as well as the extent to which they participate in the survey by furnishing tools and men for use by the soil scientist, and (3) the impressive variety of soil characteristics and genetic factors a soil scientist must consider in classifying and mapping the soils. ♦

Outdoor Teaching in High Schools

THREE high schools in Maine feel that students will learn a lot more about nature outside than in a classroom and are planning to develop outdoor laboratories for teaching.

The board of supervisors of the Waldo County Soil and Water Conservation District and the Soil

Conservation Service have been asked to provide technical help in planning these laboratories—the first in Maine—and laying out the trails and ponds.

The three high schools include Mount View in Thorndike, Belfast, and Searsport.

Mount View High School, with

1,200 students, has about 10 acres of natural woodland for use as an outdoor laboratory and plans nature trails, biology study plots, forestry practices, tree planting, and wildlife shrub plantings. Some of this area will be left natural except for trails to cross the area. The school also plans to identify trees, shrubs, plants, mosses, rocks, and soil types, and place in the laboratory signs showing economic uses and other values.

Belfast High School serves 2,000 students and has about 3 acres of land for use as a study area. They will build trails and a small dugout pond.

Searsport High School, with about 700 students, has 4 acres of woodland and some open fields. Nature trails and a pond will be important features of the laboratory.

All these schools plan to have the students do most of the work, and all signs will be made in the shops. Other help will be available as needed—NORRIS D. BRALEY, *Work Unit Conservationist, SCS, Belfast, Maine.* ♦

Science Teacher Clayton Blood; Work Unit Conservationist Norris Braley, Belfast; Principal Robert Perkins of Searsport High School; and Biology Teacher Peter Pierce review a soil and capability map of the outdoor laboratory just before planning.



Cooperators Pass 2 Million Mark

The number of cooperators in soil conservation districts passed the 2 million mark during the 1965 fiscal year.

Preliminary totals of reports from SCS field offices showed more than 2 million cooperators operating more than 662 million acres of land under conservation agreements as of June 30.

The Soil Conservation Service provided more than $3\frac{1}{3}$ million separate services on conservation planning and application to more than $1\frac{1}{4}$ million land owners and operators, a slight increase over the previous year.

At the same time, SCS consultative services increased approximately 10 percent. ♦

Community Builds New Irrigation Pipeline

A NEW irrigation pipeline system has become a reality for Millard County, Utah, where for the past 50 years irrigation water loss has been a real problem.

Installation of the pipeline project was planned, constructed, and financed as a community effort. The project was administered by the Oak Creek Irrigation Company, co-operating with the Millard County Soil Conservation District.

Project action got under way with a public meeting where 95 percent of the 80 families in the area voted in favor of the new concrete pipeline. New officials were elected to the irrigation company to push through the largest project in the county's history.

The accomplishment consisted mainly of laying concrete pipe, construction of forms for reinforced concrete, and the planting of crested wheatgrass and smooth bromegrass on disturbed soil.

Design specifications included an "alpine" type inlet structure to allow high spring runoff and flash floods to pass over without endangering the pipeline.

Technical assistance for their project was made available by the Soil Conservation Service. Financing and other assistance were obtained from the Utah State Water and Power Board, Millard County Agricultural Stabilization and Conservation Committee, and U.S. Forest Service.

Original plans indicated the project would cost about \$78,000 if built by a contractor. The decision to let the irrigation company act as contractor and subcontract segments of the job resulted in a \$15,000 saving over the estimate.

The 300 residents of Oak City are proud of their accomplishment, having completed, at a big saving and ahead of deadline, a job that will greatly benefit their agricultural enterprises. — DALE WEBBER, *Work Unit Conservationist, SCS, Fillmore, Utah.* ♦



Cloyd Day (l.) explains plans for a 4.6 mile pipeline to members of the irrigation company which acted as contractor for the project. They subcontracted only those jobs they could not do themselves.



Members of the Oak Creek Irrigation Company inspect inlet structure, a unique "alpine" type, designed to withstand flash floods. From left, Josh Finlinson, Reed Lovell, Melvin Anderson, and Peter Nielson. Lovell and Anderson are company officers.

Conservation Plan Key to Success On Butts Farm

THE JAMES BUTTS farm is a busy, prosperous, and attractive place. A modern home, modern farm equipment, farm ponds, a variety of crops on contoured acres, and fat beef cattle attest to the prosperity of the 615-acre farming enterprise in the Slater community of Oklahoma.

The present Butts home is on a corner of a 40-acre piece of land where the owner lived as a boy. His mother lost the farm after his father died. He worked as a plasterer and in a West Coast shipyard during and immediately after World War II and saved enough money to buy his old home place. James and Chinetta Butts now own 284 acres and lease another 331 acres.

Butts credits his success to a sound soil and water conservation program, planned in cooperation with the Little River Soil Conservation District.

"Making out a farm conservation plan was the best thing I ever did for my place," he says. Bill Dowd of the Soil Conservation Service helped him develop the plan for the 284 acres he owned, calling for 106 acres in pasture, 91 acres in crops, 72 acres in hay, and 15 acres in woods. Butts planted grass on the steeper slopes that once had grown cotton.

Butts' hay operation is growing. He produces some 25,000 bales of alfalfa and Johnsongrass hay a year.

Conversion to livestock production and diversification of crops "didn't come easy," Butts says. Yet, his livestock program supported a losing operation in cotton for several years, until the land conversions of his conservation plan were completed.—EARL J. HAYES, *Work Unit Conservationist, SCS, Idabel, Okla.* ♦



James and Chinetta Butts work hard to maintain their prosperous conservation farm.



Soils in Relation to Crop Growth. BY FIRMAN E. BEAR. 1965. Reinhold Pub. Corp., New York. 297 pp., illus. \$12.50.

A book on soils and soil management by a distinguished professor, a fellow and former president of the Soil Conservation Society of America, and for many years editor of the international journal, *Soil Science*, is certain to find wide interest among professional soil conservationists.

The book is not written for professionals, however. Its purpose is to explain the subject matter of the profession to the nonprofessional. This it does with skill and clarity, thanks to the author's professionalism as a writer and editor.

A layman's book on a subject as broad as this must be highly selective in content. This one surveys briefly the general subjects of the origin and classification of

soils and their physical, chemical, and biological properties. Then it considers in more detail the practical management of soils for crop production with emphasis on minerals and fertilizers. One chapter is devoted to soil conservation as such.

The book draws heavily on published sources of information and credits many tables and charts to their general sources, but does not cite specific references or provide a list of suggested readings.—B. O.

Introduction to the Outdoors. BY BEN OSBORN. 1965. Audubon Naturalist Society of the Central Atlantic States, Inc., Washington, D. C. 34 pp. \$1.00 (20 percent discount in lots of 10 or more to educational and conservation organizations).

This little book is a guide to reading and study about the outdoors. Prepared as a course outline for the Graduate School, USDA, it is useful to anyone wishing to pursue a personal program of nature study and outdoor experience. While the reference list is directed at the resources of

the mid-Atlantic region, its application covers most of Eastern United States.

It is organized under five main headings: Outdoor Living; The Things Around You; Reading the Landscape; Recreational Use of Inhabited Areas; and Conservation and Education. Following a brief discussion of key topics under each heading, the author gives a comprehensive bibliography of study and reference books. These are scaled as "essential," "preferred," "adequate," and "useful," and further classified as "beginning," "technical," or "general." In addition, specific references are given for sources of equipment, camping directories, natural history and conservation organizations, and publishers' addresses.

Anyone building a library on natural history, conservation, and outdoor living would do well to be guided by this publication. Those who want to plan their reading from public libraries will find it equally dependable.—FRANK C. EDMISTER, *Resource Development Division, SCS, Washington, D.C.*

Comparisons in Resource Management. EDITED BY HENRY JARRETT. 1961 (*Reprinted 1965*). *University of Nebraska Press, Lincoln.* 271 pp., illus; paper. \$1.65. \$1.65.

This paperback reprint makes available at low cost the record of discussions of "six notable programs in other countries and their possible U. S. application" conducted in Washington, D. C., by Resources for the Future in the spring of 1961. The book is an exact reproduction, in smaller page size, of the Johns Hopkins Press edition reviewed in the September 1962 issue of *Soil Conservation*.

The problems discussed are: National parks administration in England and Wales, small forest holdings in Sweden, preservation of natural areas in Great Britain, water pollution abatement in West Germany, local integration of pro-

grams in Canada, and development of a region in France.

The fact that University of Nebraska Press sees fit to reissue the book attests to the lasting value of the essays.—B. O.

The Federal Lands: Their Use and Management. BY MARION CLAWSON AND BURNELL HELD. 1957. (*Reprinted 1965.*) *University of Nebraska Press, Lincoln.* 501 pp., illus. \$1.95.

This paperback edition makes it easy for any conservationist to have on his reference shelf the most comprehensive treatment available on the management and use of our Federal lands. It is an exact reprint, in slightly reduced page size, of the original hardback edition of a study sponsored by Resources for the Future.

The book contains both an exhaustive collection of facts about the Federal lands and a perceptive discussion of problems, policies, and trends in their administration and management.—B. O.

New Publications

The Land Utilization Program 1934 to 1964. BY H. H. WOOTEN. 1965. *USDA Agr. Econ. Rpt. 85.* 85 pp., illus. Report covers a submarginal land purchase program that encompassed some 250 utilization projects, totaling 11.3 million acres in 45 States, with occupancy by nearly 25,000 needy families of the acquired land.

SCS's role in this program began in 1938 when the Service was given responsibility of administering some 7 million acres in 105 projects as a part of its program for conservation and improved use of agricultural land. Most of the agricultural projects have been under the administration and management of the Forest Service and the Bureau of Land Management since 1954.

Causes, Control, and Prevention of Gullies at Various New England Locations. BY ROBERT S. PALMER. 1965. *USDA Conserv. Res. Rpt. 2.* 34 pp., illus. A factual report on specific examples of gully erosion, primarily in the Connecticut River Valley and citing literature on the subject. Conclusion: "Modifying the environment by cleaning the land of timber, especially from shallow soil, for

agricultural use is the principal cause of accelerated erosion. Surface runoff is the major cause of gullying in New England." General suggestions for control are given.

Evapotranspiration and Soil Moisture-Fertilizer Interrelations With Irrigated Winter Wheat in the Southern High Plains. BY MARVIN E. JENSEN AND WILLIS H. SLETTEN. 1965. *USDA Conserv. Res. Rpt. 4.* 26 pp., illus. Results of a 3-year study at the Southwestern Great Plains Field Station near Bushland, Tex. Delaying irrigation until the soil moisture was depleted reduced evapotranspiration, but reduced yield even more. Using nitrogen fertilizer gave the opposite result, increasing yields more than water use.

Effects of Alfalfa, Crop Sequence, and Tillage Practice on Intake Rates of Pullman Silty Clay Loam and Grain Yields. BY MARVIN E. JENSEN AND WILLIS H. SLETTEN. 1965. *USDA Conserv. Res. Rpt. 1.* 25 pp., illus. Results of a 6-year study of conservation practices on the Pullman soils in the High Plains of Texas. These soils represent more than 5 million acres of the "hard-lands" in the Southern High Plains of Texas, New Mexico, and Oklahoma.

A Soil Science Career for You in SCS. 1965 (rev.). *USDA Misc. Pub. 716.* 4 pp., illus. A well-illustrated foldout describing the work of SCS soil scientists in soil classification and mapping, soil survey interpretation, and soil investigation in the laboratory and field.

Introduction, Spread and Areal Extent of Saltcedar (Tamarix) in the Western States. BY T. W. ROBINSON. 1965. *U. S. Dept. Int., Geol. Surv. Prof. Paper 491-A.* 12 pp., folded map. Gives the history, growth, water consumption, and stream regimen effect of the plant in 15 of the 17 Western States.

Soil Surveys

Deuel County, Nebraska. BY EDWARD H. SAUTTER, ROSS D. GREENAWALT, F. DWIGHT PERTELSON, JOHN E. WIL-LARD, RUDOLPH ULRICH, AND ROBERT OLSON. 96 pp., illus.; maps 3.17 inches to the mile (1:20,000).

Tompkins County, New York. BY JOHN A. NEELEY. 1965. 241 pp., illus.; maps 3.17 inches to the mile (1:20,000). Soils surveyed by E. B. Giddings and John A. Neeley, SCS; and Carl S. Pearson, Cornell University Agricultural Experiment Station.

From the Administrator:

Musts for The Year Ahead



AS WE DO every fall, the Administrator's staff and the State Conservationists recently spent a week together taking a searching look at our job, our progress, and our needs and goals for the future.

Out of these deliberations, we agreed on policies and goals for a number of pressing problems in the fast-changing field of resource conservation.

For the guidance of SCS field units and the information of our cooperators, I call special attention to 10 items that we regard as "musts" for the year ahead:

(1) *Respond aggressively to broadening conservation district objectives.*

The central concern of districts has undergone a gradual evolution in 28 years. Early efforts were largely directed toward preventing soil erosion and improving agricultural efficiency. Experience led to broadened understanding of the interrelationships of soil, plant, forest, wildlife, and, especially water conservation, and districts strengthened their efforts in these fields. This has led to more comprehensive programs of natural resource planning, development, and utilization, and expansion of group programs to larger areas of land and communities of people. SCS must respond with sound technical guidance for the broadened conservation efforts of local agencies and organizations.

(2) *Strengthen non-Federal financial participation in conservation district work.*

The greatest challenge facing the conservation movement today is how to marshal the human and financial resources to do the job. During the past decade, there has

been substantial increase in non-Federal sources of financing conservation. This development must be encouraged.

(3) *Encourage and assist conservation district governing bodies to effectively participate in resource planning for regions and areas as well as for local communities.*

Broad plans for regions and areas should provide the framework for integrated resource development and use. At the same time, we must not forget that the individual property is the basic unit on which conservation must be done in rural areas. Individual plans are absolutely necessary to implement framework plans. We must help local people develop both broad and specific plans without depreciating the need and value of either.

(4) *Pursue an aggressive approach to cost reduction.*

In spite of commendable progress, we must aggressively seek further increases in efficiency to meet cost-reduction goals.

(5) *Meet goals for Negro employment.*

We did a good job last year in moving ahead on employment of Negroes. We intend to continue our nationwide recruitment effort. I have confidence we will succeed again this year in our steady progress in equal employment.

(6) *Take aggressive action to replenish personnel reserves at the entrance or trainee level.*

Consistent with ceilings and quotas, we must provide a consistent, high-quality intake of trainees based on a realistic concept of a well-balanced staff for existing programs and for programs still in the development stage.

(7) *Make land treatment the first and foremost element of watershed projects.*

Land treatment in many watersheds is excellent. Where it is not, it must be accelerated to the extent necessary to make every project, upon completion, a living example or "showcase" of sound land use and treatment.

(8) *Complete the watershed needs inventory promptly and make effective use of the information developed during river basin investigations.*

The recent passage of the Water Resource Planning Act and the new Public Works and Economic Development Act and the increasing public concern over water resources require that we be in a position to respond quickly and efficiently to requests for information about the needs for upstream development. The updated Conservation Needs Inventory and information obtained from river basin surveys are essential to meeting this demand.

(9) *Avoid stimulating surplus crop production.*

We must avoid committing our technical and financial resources to activities that will unduly and inappropriately stimulate the production of surplus crops. We cannot authorize planning assistance for watersheds where it is apparent that the principal benefits will stem from increased production of surplus crops resulting from restoration of former productivity, more intensive land use, or changed land use.

(10) *Speed up soil survey publication and reduce soil survey costs.*

The increasing demand for modern soil surveys in the many non-agricultural aspects of land use and resource planning makes it imperative that we accelerate this important work. We must find part of the funds required for publishing more reports by reducing unit costs.

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Cattle Association Builds a Novel Pond

IMAGINATION AND INITIATIVE in the face of necessity are returning better range management to the Buckhorn Cattle Association, a group of 21 livestock owners with about 1,000 head of range cows, near Castle Dale, Utah.

The Buckhorn Flats cattle allotment "droughted" out during the end of nearly every grazing season and made stockmen bring their stock off the range for lack of water, forcing some ranchers out of business.

Byron Johansen, one of the larger operators, watched for years a spot under the ledges of Cedar Mountain on the north boundary of the allotment, where, in spite of low rainfall, water came dripping over the ledge. He believed some livestock water could be provided if a pond were built under these ledges.

In April 1963, with SCS assistance, a pond of 8 acre-feet capacity equipped with adequate overflow facilities was built under the sheer ledges. Since it has no other source of water except runoff from the ledges, it may have seemed taking a pretty big chance in a desert area of less than 7 inches average annual precipitation.

After the pond was built, the



August 1963 rains dripping from the ledges of Cedar Mountain nearly filled the new pond, storing water for many months' supply.

summer waxed hot and dry, but early August brought several small thunder showers, and water came spilling over the ledges filling the pond to within 1 foot of the overflow spillway.

Recently, Marius Johnson, another of the stockmen said, "That

sweet little pond has never been dry since the first drop filled it 2 years ago."

Another success story of man conquering the land and making it work for him.—K. MARSEL TINGEY, *Work Unit Conservationist, SCS, Castle Dale, Utah.* ♦

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JANUARY 1966

VOL. 31 NO. 6

Soil Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

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McBee
Walstrom
Brown
Bentley

A Woodland's Worth
Page 123

Land Use Guide
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Conservation in Unusual Settings
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Investment . . .

Nowhere is the economics of conservation more elusive than in figuring the values of farm woodlands.

The long wait to timber harvest holds small attraction to most owners, especially for low-grade sites.

When Economist Carroll Dwyer explained his concept of "the timber savings bank" (p. 123) at the recent Midwest Woodland Workshop, SCS conservationists began to see new hope for managing woodlands as an investment. By comparison, common stocks do not seem such a bargain.

This method of evaluating costs and returns is being developed as a standard procedure for SCS.

Soil Guide: Maine's *Soil Suitability Guide* was such an immediate hit with land owners and planners that the limited printing is already exhausted.

Although there's little chance of getting a copy of the book, you can get an idea of the plan of rating every soil unit for every possible use from Conservationist Donald Dinsmore's article (p. 125).

Such a complete interpretation of soil surveys for all users is a goal to be sought in every State. Although the job must be done locally in each case, Maine's plan of combining the knowledge of all resource experts sets a practical pattern.

COVER: Snow in the Idaho mountains is beauty to those who can see it. It is also the lifeblood of agriculture and industry as the water supply at lower elevations. SCS snow surveys indicate a favorable water situation in the West this year.

Soil Conservation

Devoted to the wise use of land and water resources

JANUARY 1966

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Woodlands Have Many Values

FARM WOODLANDS have many profitable uses. An understanding of woodland values will help the rural landowner decide whether it is worthwhile to plant available acres to trees. Farmers with established woodlands may not realize how valuable their forests really are.

The woodland owner must consider the potential of every acre he devotes to trees. Should he convert his woodland to other uses? Is he justified in practicing intensive management of his woodlands?

These questions can be properly answered only after thorough consideration of his woodland's many values. The Soil Conservation Service is currently developing procedures for collecting and analyzing information in a way to give more realistic answers.

The landowner needs information on soils, forest site classes, growth rates, and species adaptation. And he needs to know "will it pay?"

Many profitable uses

Most economic evaluations of farm woodland by traditional methods consider only the income from saw logs, pulpwood, or poles. Some evaluations include other wood products, such as cooperage, charcoal, or veneer bolts. But, if the woodland is to be fairly appraised, all of its products, whether harvested on an annual or a periodic basis, must be considered. A fair market value should be placed on each product whether it is used by the owner or sold.

Christmas trees, ferns, greenery, nuts, cones, shrubs, sap, and other forest products may be—and frequently are—harvested for the landowner's use or for sale. The landowner may obtain fuel, posts,

Analyzing costs and returns shows whether woodlot is asset or liability

By Carroll H. Dwyer

Resource Development Division, SCS, Washington, D. C.

or poles for his own use; he may graze farm livestock on native forage in farm woodlands. Most farm woodlots support some kinds of wildlife which may be harvested by the landowner or by the public through the sale of hunting privileges. Woodlands may also be used for income-producing recreation. These benefits should be figured in the total value of the woodland. The SCS cost-return analyses consider all these values as income.

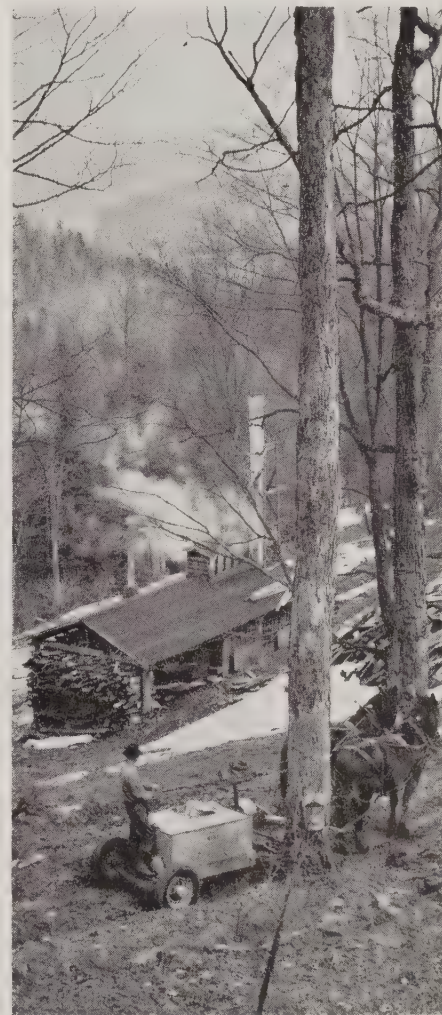
Most woodlands have values which are not easily translated into monetary terms. Pleasing scenery, fall colors, and abundant bird life have real value to most landowners and to the general public. Woodland may help assure a clear, stabilized streamflow, a slowing down of runoff, and prevention of sedimentation. While the intangible values of woodlands can not be precisely credited to the income side of the ledger, they often weigh heavily in determining whether the farm woodlot is a liability or an asset.

In addition to considering total values as the measure of a woodland's worth, there is need to revise methods of arriving at and expressing these values to give the landowner a clearer understanding of the value of his woodland.

Most evaluations or cost-return projections for woodland today are developed to show the net return, either as a lump sum at har-

vest time or as the "average annual equivalent net return"—the return that would have been available if the income had occurred at a uniform annual rate. All costs are included and are carried at applicable compound interest rates until the timber crop is harvested.

Any income from sales of pulpwood, poles, or saw logs is credited as income as it occurs. This income



Maple sirup, being made here on a western Maryland farm, adds to the economic return of the woodland.



Fuel wood, at the right, is a secondary product of a woodland being cut for pulpwood.

is carried forward at the same compound interest as costs until the final harvest. Total gross costs are then deducted from total gross income to determine net return. Several variations of this technique are used.

An example, adapted from table 21 of the publication, "Timber Income Potential from Small Forests in the Missouri Ozarks," by John H. Farrell (U. S. Forest Service Research Paper CS-11, Sept. 1964), illustrates the usual procedure.

The woodland is a hardwood stand on site 2 (site index 50), receiving intensive management at medium levels of cost. Stumpage price is \$20 per 1,000 board feet. The management practices include clearing and weeding at 20 years of age and thinning at 35 years. Periodic harvest cuts are made at 10-year intervals with the clear-cut at 85 years of age.

Annual costs for this woodland are estimated at 13 cents per acre for taxes, 4 cents for fire protection, and 10 cents for management, a total of 27 cents per acre per year. Periodic costs expected are \$3 per acre for the clearing and weeding at 20 years, \$4.80 for

thinning and marking at 35 years, and \$1.30 for marking at each of four 10-year intervals.

Expected income from periodic cuts of pulpwood and saw logs at 10-year intervals amounts to \$5, \$16.50, \$28.50, \$34, \$26, plus a final cut of \$152, a total of \$262.

All costs and returns are carried at compound interest of 3 percent per year from the time they occur until final harvest. Accumulated gross costs of \$107.65 are subtracted from accumulated gross income of \$393.20 to obtain the future value of gross income, \$285.55 per acre. This amount is discounted to present worth and amortized to obtain an "average annual equivalent value" of net return of \$1.48 per acre.

This type of analysis is sound economics as far as it goes, but in many cases it may tell only part of the story. All costs, whether in cash or for labor or equipment, are charged as cash costs and are carried forward at compound interest until final harvest. The accumulated costs are then treated as "sunk," or nonrecoverable, costs as far as the evaluation is concerned. Actually, they are not sunk costs at all, because they are

recovered by the owner when he sells his forest products.

Instead of considering the various expenditures as costs, they could be considered as *savings*. They are, in effect, being deposited in a timber savings bank at compound interest at whatever rate is being used. When the timber is harvested, these savings are payable to the owner in a lump sum exactly as is done with a U. S. savings bond.

In the traditional economic analysis, the land normally is valued at its bare cost (without timber cover). At harvest it is credited at the same value as originally. Land prices, however, have been steadily increasing and have in many instances increased several hundred percent during a long (50 to 100-yr.) timber rotation.

If the owner or his family performed some or all of the cultural or harvest operations, they were converting their labor, for which there may not have been a market, into money. This converted time has been carried at compound interest exactly as if it were a money outlay, whereas it may have been largely in labor performed by the landowner's family.

In effect, then, if the accumulated values are greater than the accumulated costs, the owner recaptures his investment; he obtains the compound interest on this investment; and he obtains an additional net return. Of course, if the owner borrows money to pay for any of the expenditures, he will not have the principal, and he must pay interest on the borrowed money.

To illustrate the effect of including secondary products of farm woodlands, let us assume that in the example cited the farm woodland is used for farm firewood, posts, and poles in addition to producing saw logs and pulpwood for sale.

One-half cord of firewood, which consists of dead or other noncom-

mercial timber, is harvested annually. The local price of firewood is \$6.50 per cord. Labor costs of harvest amount to \$4.50 per cord. Ten posts or poles of noncommercial size are harvested annually and are valued at 10 cents each. Labor costs of harvesting each post or pole are 5 cents. The owner also rents hunting privileges for deer and turkey for 15 cents per acre per year. Annual per acre returns and costs on this woodland then become:

	Gross returns	Labor and equipment costs	Net return
Firewood ½ cord @ \$6.50 cord..	\$3.25	\$2.25	\$1.00
Posts and poles, 10 @ 10¢ each	1.00	.50	.50
Hunting at 15¢ per acre	.15	—	.15
	<u>\$4.40</u>	<u>\$2.75</u>	<u>\$1.65</u>

Since this is an annual operation it is not necessary to carry the costs and returns to future value and discount them as was done with the saw logs and pulp. If there had been periodic costs or returns, it would have been necessary to treat all of them as shown in the example.

The additional net return of \$1.65 added to the average annual equivalent net return of \$1.47 from the pulpwood and saw logs, as shown in the original example, gives a total equivalent net return of \$3.12 per acre annually. This amount is available to pay interest on the land, as a return to management, or as profit.

A wider recognition of the many values of woodlands, and their economic evaluation by the new SCS cost-return procedures, should lead to greater attention to woodland conservation and management on the estimated 293 million acres of private woodlands in the country.

SCS conservationists will be better equipped to advise the some 3 million owners of farm woodlots on desirable land use alternatives, and to encourage the conversion of unneeded cropland to other uses. ♦

Maine's Guide to Land Use

Soil suitability ratings tell owners of sites' potentials and limitations

By Donald T. Dinsmore

Assistant State Conservationist, SCS, Orono, Maine

A "SOIL SUITABILITY GUIDE," bringing together the knowledge of experts in all phases of resource use to interpret soil maps for a wide range of land uses, is gaining widespread popularity in Maine.

Designed for speedy reference to ratings of some 650 soil units, the new tool provides landowners, town planning bodies, and resource conservation agencies advice on 5 major categories of interest: Agriculture, recreation, woodland, wildlife, and urban and industrial use.

The "guide" itself is a 40-page mimeographed booklet issued jointly by the Soil Conservation Service and the Maine Agricultural Experiment Station, Orono. It

consists mainly of tables showing the suitability ratings of every kind of soil in the State for the different uses.

Local interpretations

With the statewide guide as a reference, each user can interpret local soil maps for the features in which he is interested. Maps for approximately 25 percent of the State are available in published soil surveys; others can be seen in local Soil Conservation Service offices where surveys are underway.

The brief, simple format invites immediate use of the information. At the same time it spurs curiosity about basic soil and water knowledge.

Rarely is a landowner satisfied

Industrial sites, such as this potato packing plant in the Central Aroostook Soil Conservation District, present problems of suitability of soils for foundations, parking areas, and waste disposal.



to merely look up and note the ratings of his soils in one of the tables. He wants to know the why's and wherefore's—the physical evaluation behind each site's limits and potentials. This he can find in the wealth of data recorded for the 8 million acres of Maine mapped to date.

Soil surveys popular

As a result, published soil surveys available in the 16 soil conservation districts are enjoying widened circulation. Where surveys are incomplete, an increasing number of callers ask for field sheets, soil descriptions, and survey notes—anything that offers information useful in land use planning.

The need for the suitability guide was made evident by the wide interest in converting cropland to recreational enterprises. Additional demand comes from the drive for more efficient farming in the face of intensified competition; a campaign to attract industry to areas of underemployment; and the expansion of housing, school plants, shopping centers, and associated public utilities.

Due to the vast range of possible land and water uses, specialists representing every conceivable interest in resource development



This putting green on a former dairy farm illustrates the new evaluations of soils needed for new land uses.

were called upon for information. Leading the effort were the Soil Conservation Service, the University of Maine's College of Life Sciences and Agriculture, and research workers of the Forest Service.

The originators of the guide are quick to point out that, although the ratings are based on the best available knowledge and the combined judgment of land use and conservation experts, they are not hard-and-fast rules. Further experience certainly will lead to revisions and improvements in the future. But soil conservationists and planning officials are agreed

that the ratings provide a useful guide to local land use decisions.

In the words of one member of the group, the assignment was clear: "Furnish guidance that can head off chaotic development. Put it in a format that anyone can use. Help taxpayers save money by steering them around costly mistakes in planning."

Taking one kind of soil at a time, specialists applied criteria that are significant to each type of land user or developer. Among the factors considered are natural site adaptability; demands of site preparation, costs of operation and maintenance, sanitation, and accessibility.

For every use

Using the correct technical name for each local soil as the basic index, the document presents five groupings of tables wherein ratings are listed under each type of user-interest, in "A" (most suitable), "B," "C," and "D" (least suitable) grades of suitability.

Six specific kinds of land use suitability are thus rated in the section on agriculture. Nine categories of recreation land development, ranging from temporary tent sites to access road construction, are indexed under another appropriate heading.

Residential construction calls for ratings of soils for drainage, percolation for septic tank fields, and other qualities than those needed for agriculture.



The woodland production suitability ratings list 10 tree species having economic interest in the State.

A wildlife habitat section furnishes guidance for three different kinds of development: Woodland, wetland, and open land.

Eight separate kinds of user-interests, varying from septic tank disposal fields to building sites, are rated for urban and industrial development.

Each section is prefaced by an explanation of the factors used by these specialists in determining the ratings.

The introduction points out that the guide "is not intended to replace detailed information on soils as found in the published soil surveys, but rather to supplement and to broaden the use of the more technical material."

Interpretive maps

Transparent overlays showing soil boundaries of specific tracts are provided to development planners in response to request or need. They may be colored according to a key corresponding to the four degrees of suitability for use. In descending order, the colors are green, yellow, red, and blue—the last being ascribed to soils having severe physical limitations and generally considered to be "very poor or unsuited to the use indicated."

Early users of the guide were more than 75 towns that adopted it in their planning procedure within a few months of its release.

Ingenious use of the guide was made at a small watershed project, where a dam providing a large recreation pool was in the planning stage. Camp and cottage development was desired by the sponsors. At a critical moment, investigators decided to check the soil suitability ratings for the entire basin. They revealed that by raising the design elevation of the water level 5 feet, future cottage owners would clear-



A new summer cottage being built along the stony shore of Peabody Pond in Sebago illustrates the expanding use of wooded areas and lakes for recreation.

ly have a greatly expanded stretch of useful shoreline. The dam was replanned accordingly.

One downstate community planner commented, "What I like is the way this thing tells you what you *can* do as well as what you'd better think twice about. These maps, for instance, show alternative places for development. They don't fence you in, by any manner of means."

For an Alpine village

Architects planning a 2,000-acre, year-round Alpine-type village for the west-central highlands

also praise the guides. They found them useful in planning for a \$30 million complex of chalets, hotels, water impoundments, and other accommodations for a sports-minded community.

Preliminary layouts were on the drawing boards when the developers awakened to the soil suitability guide. SCS furnished supplementary soil maps and site investigations. Problem and optional areas were speedily discovered. Using the maps and guidelines, the architects revised their plans with large savings.

Another illustration involves a

Excerpts from the five soil suitability tables illustrate how each of the 650 different kinds of soils are rated for every potential land use.

AGRICULTURAL SOIL SUITABILITY

Mapping Unit (Alphabetical)	Slope	General Cropland	Forage Crops	Pasture	Irrigation	Orchards	Potatoes
Acton 1	A	B	A	A	B	D	C
	B	B	A	A	B	C	C
	C	B	A	A	C	C	C
Acton vstl	A, B, C	D	D	D	D	D	D
Adams fsl	A, B	C	C	C	B	D	D
	C	C	C	D	C	D	D
	D	D	D	D	D	D	D

WOODLAND PRODUCTION SOIL SUITABILITY

Mapping Unit (Alphabetical)	Slope	White Pine	Red Pine	Spruce - Fir	White Cedar	Hemlock	Northern Hardwood	Oak
Acton 1	A, B, C	A	C	A	A	A	A	B
Acton vstl	A, B, C	A	C	A	A	A	A	B
Adams fsl	A, B, C	B	A	D	D	D	C	C
	D	C	B	D	D	D	C	C

WILDLIFE HABITAT PRODUCTION SOIL SUITABILITY

Mapping Unit (Alphabetical)	Slope	Openland Wildlife Habitat	Woodland Wildlife Habitat	Wetland Wildlife Habitat
Acton 1	A	B	A	C
Acton vstl	B, C	B	A	D
	A	D	A	C
	B, C	D	A	D
Adams fsl	A, B, C	C	C	D
	D	D	C	D

RECREATION DEVELOPMENT SOIL SUITABILITY

Mapping Unit (Alphabetical)	Slope	Undeveloped Tent Sites	Developed Tent & Picnic Area	Trailer Park Sites	Camp or Cottage Sites	Playing Field, Shooting Ranges	Golf Courses	Small Pond Building	Winter Sports Area	Roads, Rec. - Farm - Forest
Acton 1	A, B	B	B	B	B	B	B	D	B	
	C	D	C	C	B	D	B	C	A	C
Acton vstl	A, B	B	C	C	B	C	D	B	D	B
	C	D	C	C	B	D	D	C	C	C
	A, B	A	A	B	A	C	C	D	D	B
Adams fsl	C	D	C	C	A	D	C	D	A	C
	D	D	D	D	C	D	D	D	B	C

URBAN, INDUSTRIAL, ETC., SOIL SUITABILITY

Mapping Unit (Alphabetical)	Slope	Septic Sewage Disposal	Lagoon Sewage Disposal	Dumps and Junk Yards	Earth Cov. Fall- Out Shelters	House Bldg. w/ Sep.Sew.Disp.	House Bldg. on Pub. Sew. Disp. Pipe and Sewer Lines	Heavy Bldg. Sites		
Acton 1	A	C	B	A	C	C	B	B	A	
	B	C	B	A	B	C	B	B	A	
	C	C	C	B	B	C	B	B	C	
Acton vstl	A	C	B	A	C	C	B	B	A	
	B	C	B	A	B	C	B	B	A	
	C	C	C	B	B	C	B	B	C	
Adams fsl	A, B	A	D	D	A	A	A	C	C	
	C	B	D	D	A	B	A	C	C	
		C	D	D	C	C	C	C	C	
	D	C	D	D	C	C	C	C	D	

Job Corps encampment being installed in the far eastern part of the State. The construction supervisor was about to rough out water and sewage facilities when a soil suitability guide came to hand. The guide was discouraging. Field checks showed bedrock at a depth of 1 foot in the entire area selected. Search for alternative areas located a suitable site a short distance away.

Since the soil suitability guide made its debut, specialists working with it have collected hundreds of similar experiences. They include instances of town, community, and area planning; timberland management; rural and urban resource development; and individual, corporation, State, and Federal planning for an infinite variety of land uses.

The maps interpreted to suitabilities for various uses evidently provide the best visual aid yet found for considering soil and water resource development alternatives and potentials. One agency specialist summed it up: "Maine simply couldn't have waited another 10 or 15 years for this guidance without planning disasters like those we've seen in other Atlantic States. With this approach, we've got a fighting chance for *quality* development—with a capital 'Q'!" ♦

Land Judging Contest

The Monroe, Wis., County 4-H Land Judging Contest has been "a major factor in explaining conservation to the future custodians of soil," say soil conservation district officials and SCS personnel. The Moose Lodge of Monroe County helps sponsor this project by giving benefit dances each Saturday night. ♦

Some day, maybe, a real champion . . .

Dog Trainer Uses Conservation To Create Range for His Charges

GIVING TECHNICAL assistance in layout of ponds, ditches, and irrigated pastures to conserve soil and water is nothing new for SCS conservationists. But a 40-acre ranch near Santa Rosa, Calif., provided SCS personnel with one of their more unusual exercises in soil and water conservation planning.

Owner Robert E. (Bob) Sevenants combines an operation that includes birds, cattle, and, most important, dogs on a ranch formerly devoted to turkeys and vineyards.

It happened this way:

Sevenants, a native of Wisconsin, put in 23 years as a member of the U. S. Coast Guard. All that while, he thought more and more about the hours spent as a boy in Wisconsin, hunting in the fields with dogs. By the time his last hitch was in, the decision had been made: He would raise and train hunting dogs.

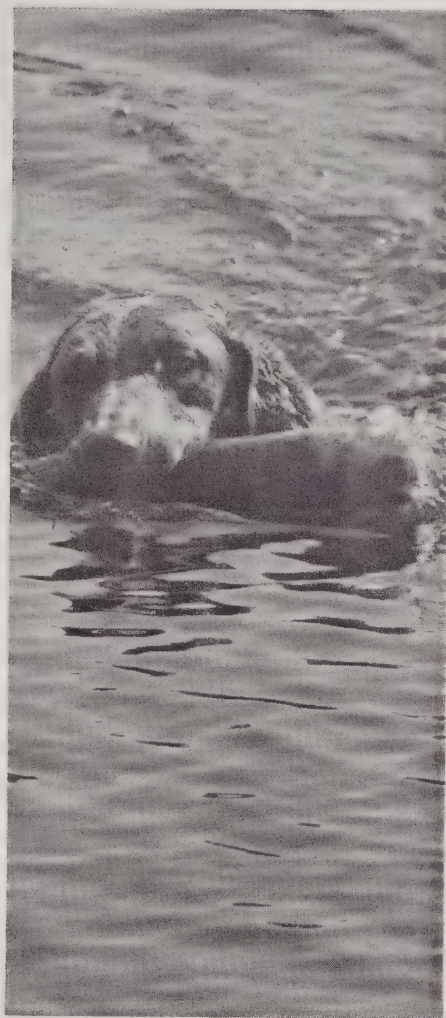
Now his ranch in Sonoma County abounds with ducks, cattle, pheasant, pigeons—and dogs, the primary business on this ranch. There are ponds and an irrigation ditch that spirals down around a hill. And around the hill are pastures being used not only by cattle but by the dogs Sevenants trains.

Sevenants has raised about 350 dogs—mostly Labrador Retrievers, but some Chesapeakes and Weimaraners, too. He owns some, trains others for people who like them for hunting.

“A well-trained hunting dog at work is the most fascinating part of hunting for many people,” Sevenants says.

The ex-Coast Guardsman had some specifications in mind for the ideal dog ranch location. It had to be at the end of a road, have plenty of water, and no close-by neighbors.

He found what he was looking for near Sonoma County Airport northwest of Santa Rosa. It was in the Santa Rosa Soil Conserva-



A well-trained dog retrieves the game on land or water.

Robert E. Sevenants shows the “trainees” the bird they are to retrieve. At right, the dog, after retrieving the game waits in the correct manner for the signal to conclude the sequence.

Photos through the courtesy of Joe Price, Jr., of *The Press Democrat*, Santa Rosa, Calif.



tion District, and Sevenants signed up as a cooperator to receive SCS help in developing a soil and water conservation plan.

Lucky thing, too, for he early discovered unexpected problems as well as the usual ones. Annual vegetation on the ranch included weeds, burs, and "stinkers" that would dry up early in the summer and be injurious to noses, ears, and feet of his dogs.

Practices and systems

Merle Gross, SCS work unit conservationist at Santa Rosa, suggested planting an irrigated pasture of perennial grass and legumes. A properly managed irrigated pasture would not only provide better conditions for training dogs but would also furnish better cover for birds and forage for cattle.

As a matter of fact, the cattle were a necessity because the grass grew tall and plentifully. Dogs had trouble finding downed birds or "dummies."

Sevenants gets cattle at auctions and grazes them over the lush

pastures. After a few months, the grass is short enough to work the dogs in and the cattle fat enough to market for a profit. He ran 80 head of them last year.

SCS also assisted in planning the irrigation system which provides water for irrigating pastures and for the lower pond where dogs are trained.

A small round hill with steep slopes presented a problem. To get some use out of this part of the property, Sevenants laid out and constructed a reservoir on top of the hill, scooping out an area 90 by 70 feet by 10 feet deep. Water is pumped up there for storage.

Ditches were constructed on grade from top to bottom, spiraling around and down the hill. A perennial grass planted between the ditches and shrubs along the banks not only stabilize the slopes but provide bird cover.

About a thousand ducks—a cross of Mallard and English-call ducks—inhabit the ranch ponds. They come flying, walking, running, and swimming when Seven-

ants takes a bucket of grain to the pond and shouts. The ducks, plus pigeons and pheasants, are important to the dog training.

Dog training

Early training during the dog's first year is handled by Mrs. Sevenants, then her husband takes over for the field training.

Sevenants takes his dogs to the field—usually several of them—in a trailer. There he lets them out individually and guides them back and forth, through fences and to the pond. Signals are by hand, a whistle, and by voice. For this, either actual downed birds or dummies are used. He also trains the dogs to work in a group so they will understand and follow orders when with other dogs.

Dogs are valuable property. A trained one may sell for several hundred dollars—not too high, Sevenants thinks, considering the work, time, and talent involved in the training.

Sevenants has the dream of every dog trainer or owner—finding that real champion, a dog that will do everything right.

Thinking about it, Sevenants and his colleagues are apt to get a dreamy look and muse: "Some day . . ." ♦

Conservation Irrigation Keeps Water Clear

A conservation irrigation system on the Roy Watkins farm in the Moses Lake Soil and Water Conservation District, Wash., avoids noticeable erosion on slopes as steep as 8 percent and returns clear water to the wasteway serving two adjoining farms.

Watkins uses a sprinkler system with buried pipelines and removes no crop residues from his fields. His rotation is wheat, sugar beets, and peas.—EARL L. HART, *Work Unit Conservationist, Warden, Wash.* ♦

A good "dog" ranch provides not only better training conditions for dogs but better cover for birds and forage for cattle. Sevenants has just called in to feed some of the wild ducks that abound on his ranch.



Pond Provides Water Supply for Three Pastures

ARLIE Broadwater gave a new twist to pond building on his dairy farm near Clarksville, Md., in the Howard Soil Conservation District. He pipes the water in an unusual way to three tanks below the dam. So the cattle have a convenient drinking place in three pastures.

Before letting water into the $\frac{1}{3}$ -acre pond, Broadwater placed a 50-gallon drum in the middle of the excavation. From the center of the drum he installed a pipe that went through the dam to the three tanks. Water flows by gravity and simple float valves control the level in the tanks. Crushed stone in the drum filters the water.

The pond was the SCS conservationists's answer to the problem of what to do with 4 acres of wet eroded land. A diversion terrace protects it from runoff and sediment from 52 acres of cropland above the dam—ELMER F. SAUER, *Work Unit Conservationist, SCS, Ellicott City, Md.* ♦

Horses and Idle Land Become a Business

The Rocking-M Horse Ranch near Augusta, Maine, is a recreational enterprise by a horse-loving family, based on horses, an idle farm, and the use of a soil map.

Dick MacLennan, a former radio station manager, heads up the business which includes selling, brokering, boarding, breeding, training, and renting horses. The three oldest children, Bruce, aged 13; Steve, aged 12; and Carol, aged 10 help with the care and feeding of the horses. They also guide the inexperienced riders on the bridle trails.

The MacLennans, in the Kennebec County Soil and Water Conservation District, live on a 90-



One of three stock-watering troughs below the pond.

acre farm that had been idle for years. Much of the open land had grown up into brush and woodland. They have kept horses for years but recently decided to switch from a hobby to a full time family business.

Dick and the SCS conservationist studied the soil map in laying out bridle trails through his woodland. He wanted to make the trail as scenic and picturesque as possible. He knew some of the soil was wet, also some of the soil was steep, but this was the area he owned and he had to make the most of it. Where the trails cross wet areas, Dick plans to build them up with gravel, on the steep areas he is attempting to lay out the trail so that it will be less likely to erode.

As the business grows he hopes to add more to his woodland recreational area. He plans to establish several small picnic and rest areas. One spot will be for group picnicking, so that the MacLennans can cater to groups.—DAVID C. CHASE, *Work Unit Conservationist, SCS, Augusta, Maine.* ♦

20,000th Farm Has Great Plains Plan

A 1,300-acre livestock-cotton farm in western Texas recently became the 20,000th farm participating in the Great Plains Conservation Program. It is owned by Mrs. Sadie A. Dockrey of Colorado City, in the Mitchell Soil Conservation District, and is operated by her son, Charles.

The 20,000 farms and ranches now in the program total about 40 million acres. Their conservation and land-use adjustment plans, the basis of cost-sharing contracts with the Department of Agriculture, call for conversion of $1\frac{1}{2}$ million acres of cropland to grass.

The 4-year contract for the Dockery farm covers a plan to improve livestock feed supplies. Cotton acreage will be reduced to about one-third the former area, or 40 acres, and the remainder used to produce summer and winter forage. The plan calls for converting 22 acres of cropland to permanent grass and 11 acres to be developed for wildlife. ♦



A few of the more than 1,000 busloads of children that visit Old Sturbridge Village each year get ready to view the New England of an earlier era.

At Old Sturbridge Village . . .

Modern Conservation Helps Bring the Past to Life

By August I. Reese

Work Unit Conservationist, SCS, Oxford, Mass.

AT OLD STURBRIDGE Village, a re-created country town of early New England, modern soil and water conservation methods are helping preserve the flavor of the past.

The village, located midway between Worcester and Springfield, Mass., is a regional museum of rural New England life. Its aim is to preserve and present the story of farm and village life of yester-

day and to pass on a knowledge and understanding of that heritage to citizens of today.

The story of the village began in the 1920's with two brothers, Albert and Cheney Wells. They collected many items in use during 1790 to 1840 and moved buildings from various parts of New England to the village. Old Sturbridge Village now covers about 285 acres.

The village was first opened to

Water used to turn the wheel of the gristmill (l.) is carried away safely in the drainage ditch. Where two trails in the new nature study area join (r.), rest benches made of native materials are provided.



the public in 1946 and had 5,172 guests that year. During 1964, nearly 375,000 visited the village, including more than 35,000 school children.

It became a cooperator with the Southern Worcester County Conservation District in October 1947. At that time, the village maintained a 25-cow dairy herd, carried on a hay and pasture renovation program, and raised broomcorn, flax, barley, pumpkins, melons, corn, squash and other vegetables.

From 1947 through 1954, the village established several conservation practices. Approximately 750 feet of drainage ditch was installed on bottom land hayfields that were subject to overflow from the Quinebaug River. The ditch also serves as an outlet for water used to turn the water wheel of the grist mill.

Other practices applied to the land included 5,000 feet of wildlife border plantings, 1,500 feet of multiflora rose, 1,500 tree seedlings for windbreaks and esthetic screening, and 5 acres of wildlife wetland development. The improved vegetation was an attraction to the many varieties of fish, waterfowl, birds, and ground game that now inhabit the waters and fields of the village.

The Soil Conservation Service gave technical help in planning the water control and vegetation practices to fit into the unique setting of the 19th century farm.

The conservation plan was revised in June 1963 when the dairy operation was eliminated and a change in program emphasis was made. The Freeman farm area at the village, however, still re-creates life on a small New England farm of the early 1800's. Oxen work the land where the agricultural crops are under cultivation.

More land was acquired, much



At Freeman farm, a yoke of oxen tills the land for crops of broomcorn, flax, pumpkins, squash, and other vegetables.

of it to remain in native cover. The Woodland Walk, consisting of 1 mile of nature identification trails, was developed. It was opened to the public in the spring of 1965. Future plans call for construction of a nature pond, which will regulate the flow of water down a natural drainageway and maintain the aquatic vegetation growing there.

Wooded areas at the village are predominately hardwoods, with

white pine gradually taking over some areas. Woodland and wildlife management is planned for these areas.

At Sturbridge, an age of the past is cooperating with an age of the present to create pleasure and entertainment for an age of the future. Natural resource development is helping assure success. ♦



Sheep and visitors enjoy each other's company at Freeman farm. Blacksmith shop is in right background.

Vacation Farm in Tennessee Hills

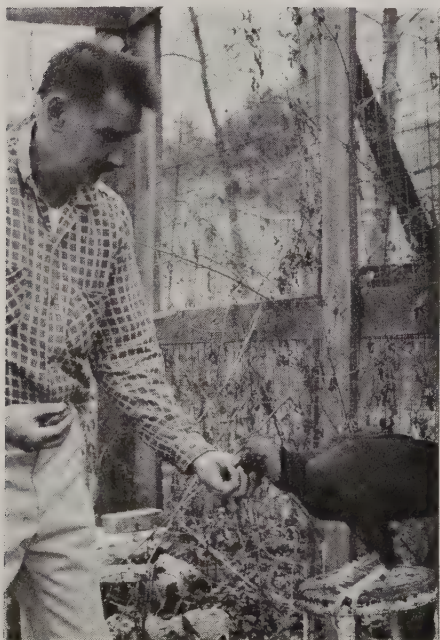
“**W**HAT we have in mind is a place where a family can have some fun and go home with a little money left,” George Brown says of his budding 400-acre recreational enterprise in the wooded hills of Houston County, Tenn.

Although Brown's plan is far from complete, visitors are already coming to enjoy the wooded trails, fresh air, and unmatched hospitality. Without many of the facilities of modern vacation farms, one might wonder what advantages the Brown enterprise offers, but it becomes apparent while talking to the proprietor and his attractive wife, Katherine.

“Well, we are new at this,” they explained, “so we just ask our guests what they want to do, then do it. Last summer we took the families for trail rides and hikes, fishing trips, and barbecues—all of which may be done without expensive improvements.”

When the Browns bought the

Dammit, the pet vulture, enjoys being handled by his master.



Mr. and Mrs. George Brown discuss their recreation project with the author (r.) at the site of a trout pond under construction.

property 8 years ago, they realized that it had very little potential for farm income. It was almost all in wooded ridges, divided by steep valleys with names like Sweetgum Hollow, Water Hollow, and Dancer Branch.

“While we saw right away that it wasn't a farm enterprise, we thought it had terrific potential for recreation.” A New Yorker, Brown believes the Tennessee hills have “more potential than the Adirondacks.”

Horseback riding was one of the first activities offered. The Browns have a remuda of six saddle horses and the tract is crisscrossed by fire lanes on which the rider can spend hours without retracing his steps. The fire lanes make riding and walking among the oaks, dogwoods, sourwood, and maples a pleasant—and not too rough—experience.

“Bunking in the farmhouse with

us is O.K. for a few visitors,” Brown said, “but we realized that if we were serious about this recreation business we needed to make some improvements. We were interested in building cabins and a trout lake. We had a conservation agreement with the Houston County Soil Conservation District and they gave us help with our recreation planning.”

Work began last fall to divert a small stream to make a fish pond. Four 200-foot raceways were built to raise rainbow trout. A scenically wooded slope above the lake will be the site for guest cabins.

The Farmers Home Administration approved a loan to make the farm improvements, including the recreation features.

Conservation practices are being worked in as the place develops. Old idle fields are being reforested with loblolly pine. Eighteen acres

of permanent pasture and 16 acres of hayland are being renovated.

One of the features of the Brown farm that sets it apart in the visitors' memory is the pet buzzards. An accomplished practical ornithologist, Brown was tapped by the Vanderbilt University Engineering Department a few years ago to assist with research on aerodynamics involving study of the flight of the turkey vulture and black vulture. The birds were trained to react on command and were photographed and otherwise studied at close range from an airplane.

"The birds soon learned to anticipate commands," Brown said, "and this canceled their usefulness

in the project. We gave them their freedom, but they continued to hang around the farm looking for handouts. It gives the place an eerie look."

Only a few of the birds are kept in the cages now. A favorite is a black vulture named Dammit. Brown raised Dammit from a fledgling. Dammit is well known in university circles for his contribution to science and has been "interviewed" on television.

The Brown enterprise is an example of how limited resources can be utilized to meet today's demands on the land.—JAMES L. BILYEU, *Work Unit Conservationist, SCS, Erin, Tenn.* ♦

With this raw area as a start, the club became a cooperator with the Cheshire County Soil Conservation District. The Soil Conservation Service mapped the soils. Biologists from SCS and the New Hampshire Fish and Game Department studied the area, and SCS engineers took a look at the old dam.

All the data collected were put together, and the planners and board of directors went to work developing a conservation plan. One provision in it divided the area into two sections—one for wildlife and one for development as an activity area for people.

Community activity

The new concept of the Cheshire Fish and Game Club is reflected in the annual program. There are bus rides for school children to nature centers and fish hatcheries. Youngsters are sent to conservation camps.

The club joins the Cheshire County Soil Conservation District in sponsoring displays that highlight concern over pesticide and

Cheshire Game Club Gets New Life From Tract of Land to Work on

By **Walter E. Nelson**

Work Unit Conservationist, SCS, Keene, N. H.

WITH THE PURCHASE of a 140-acre plot of cutover woodland, the Cheshire County, N. H., Fish and Game Club launched a project that has attracted national attention.

In addition to converting a run-down piece of property to nature trails, picnic areas, and trap and skeet fields, the club has generated among its members an appreciation for resource conservation.

Where once the 300 members viewed the outdoors simply as a place to take fish and game, they now are concerned with the protection, improvement, and use of it.

It all started in 1960 when the club acquired property just north of Keene City. It was a heavily logged area, its most promising features being remnants of an old stone dam and a debris-strewn stream much abused by litterbugs.

In spite of its deteriorated condition, some wildlife remained, and there were den trees, bramble

edges, yew thickets, and alder runs, all enhanced by a certain amount of isolation.

A long-time member of the Cheshire County Fish and Game Club, John Stugis (l.), helps SCS staffer Ken French girdle a marked tree in carrying out wildlife improvement work. French also is a member of the club.



pollution problems. It cooperates in recreation workshops aimed at outdoor enjoyment and safety. It fights for legislation protecting the outdoors from exploitation and waste. Now it plans to sponsor an Explorer Scout troop in the area.

Most of the projects are under way. Parking areas and access roads are developed. The dam is built. The rifle range and trap fields have been in use for 3 years, and several acres of wildlife improvement work has been completed.

In the wildlife section a wide area has been limited to yew and native wildlife shrubs. Woodcock cover is improved, and trails are completed for bird watchers and others who just like to roam the woods. The areas are open to

everyone.

For 40 years it was an average small community organization, holding social affairs and civic projects. But when they bought some land the Cheshire Club members began to win area-wide recognition with their conservation program.

The Governor's Conservation Award, sponsored by the Sears-Roebuck Foundation, was presented by Governor John King, and the club received the President's Award of the National Wildlife Federation.

Thus, interest in soil and water conservation and a tract of land on which to carry out a program moved an average club group from obscurity into State and national prominence. ♦

Farmer Restores Depleted Estate

(Photo on p. 144)

WHEN JAMES WATKINS took over operation of a 277-acre sloping farm near Danville, Ky., a few years ago he was determined to make a success of developing and improving it. And his work was cut out for him.

Today he is justly proud of the outstanding example the farm now represents in the community.

What Watkins acquired was the depleted remains of a 100-year old farm, once the pride of the landowner. Years of intensive up and down hill cultivation and heavy livestock grazing—followed up by lack of care—left the old estate in barren desolation. The earth was eroded, topsoil nearly gone, and where there was growth it amounted only to brush, grass, and briars.

As a first step Watkins became a cooperator with the Boyle County Soil Conservation District, and working with the landowner, Mrs. Mary Swope, and SCS conservationists, he decided on a plan of action.

Following the new conservation plan for the farm he removed old fences which were not conducive to good land use. A contour strip-cropping system for growing 4 acres of tobacco, 26 acres of corn, and 60 acres of hay was installed on the long slopes. Eroding gullies were smoothed and protected with Kentucky 31 fescue grass cover.

Much of the land used for grain production was shifted to permanent vegetative cover. All the hayland and pastureland, badly eroded because of poor soil cover and overgrazing, has been renovated and is properly grazed to insure good soil cover and protection throughout the year. The hay crop consists of fescue, red clover, and Kobe lespedeza.

Watkins has a herd of 51 Hereford cows which grazes on pasture of annual lespedeza, white clover, fescue, and bluegrass. The cows produce feeder calves for local market.

In addition to his main enterprises, Watkins produces and sells tomatoes, beans, and strawberries. He said the time spent in growing

cash crops is provided by practicing conservation farming.

Watkins is now a Boyle County District supervisor. For next year he plans to improve the water system on the farm by developing a spring, walled in a century ago by Confederate soldiers. He also will construct two lakes for livestock water, fish, family recreation, and irrigation.—EDWIN E. KING, *Work Unit Conservationist, SCS, Harrodsburg, Ky.* ♦

Public Recreation Areas Cost-Shared

Specific recreation area acquisition and development projects to be financed by the Land and Water Conservation Fund may now be submitted from 12 States whose comprehensive recreation plans have been approved. The Bureau of Recreation has allocated a total of \$28,294,531 to the following States: California, Connecticut, Indiana, Louisiana, Missouri, Nebraska, New Hampshire, New York, Ohio, Oregon, Pennsylvania, and Rhode Island.

Since soil and water conservation districts are bodies qualified to sponsor or otherwise participate in local projects, they may be provided for in the State plans. ♦

Water Supply Outlook Is Good for West

The 1966 outlook is good for water supply for irrigation, municipal power, and industrial use in the 11 Western States.

The USDA water supply forecasting summary, based mainly on snow surveys by the Soil Conservation Service and cooperating agencies, indicates that the 1965 water year in the west was the most favorable of the past 10 to 15 years and many reservoirs are carrying over record storage into 1966.

Practically all reservoirs have more water than at the beginning of the 1965 irrigation soils. Mountain soils are wet, and snowfall is substantial in the Rockies. ♦

Soil Conservation Key to Success for Wisconsin Farmers

FARMERS Frank and Pat Snell, and Vernon Roth of Crawford County, Wis., agree that soil and water conservation is a year around job.

They have gradually improved their farms through well planned and developed conservation programs.

Terraces were added on the Snell farm in 1949 and 1951. Two grade stabilization structures were built in 1960. Contour strips were remarked on several fields, following the contour more closely and made narrower in width.

The Snells improved their beef feeding setup. They now feed low moisture grass silage (haylage) from two large silos. Summer grazing on their pasture areas is carefully managed and controlled.

Roth added several diversions and a grade stabilization structure. He also is bringing the old contour strips up to modern standards. He is planning a new barn for his dairy herd. Much of the material for it is coming from his managed woodlot.

Roth has followed conservation practices based on the capability of the soil. He has converted many acres of land from corn to hay and grass. The amount of high quality alfalfa being harvested now is much greater than the 12 loads of



Vernon Roth puts third crop alfalfa in a barn on his farm. A small pond is at lower left.

clover hay harvested in 1939.

Both Roth and the Snell brothers signed agreements with the Crawford County Soil Conservation District in 1939, the first year it was in operation. Since then, at the forefront of many advances in

farm technology has been the adoption of sound soil and water conservation programs—the foundation of the successful Snell and Roth enterprises.—A. J. AMUNDSON, JR., *Work Unit Conservationist, SCS, Gays Mills, Wis.* ♦

Pat and Frank Snell find a moment to relax at the improved beef feeding yard and bunks on their Wisconsin farm.



Conservation Farming Provides Good Living



Joseph B. Tolbert, and his two sons, John Robert and Joseph Dennis, show part of the beef cattle herd on their diversified farm.

IN THE OLD Bell Place Community for Greenwood County, S. C., Joseph B. Tolbert does not believe in "putting all his eggs in one basket."

He believes a diversified program fitted to a soil and water conserva-

tion plan on his 200-acre debt-free farm will do three things: Provide a comfortable living for his family, furnish valuable experience in conservation farming for his two adopted sons, John Robert and Joseph Dennis; and convert more land for pastures.

When Tolbert became a cooperator with the Greenwood Soil and Water Conservation District in 1943, he was mainly a row crop farmer. He terraced his land and practiced crop rotations.

In 1958 after he started raising a few cattle and hogs, he asked for help to revise his conservation plan to include a better cropping system adapted to the land's capability and to grow more feed for livestock. The new plan called for more sod and close-growing crops, including legumes for better erosion control, improving the terrace system, and establishing meadow outlets. His livestock program has grown to a 20 brood-cow herd of beef cattle and 8 brood-sows.

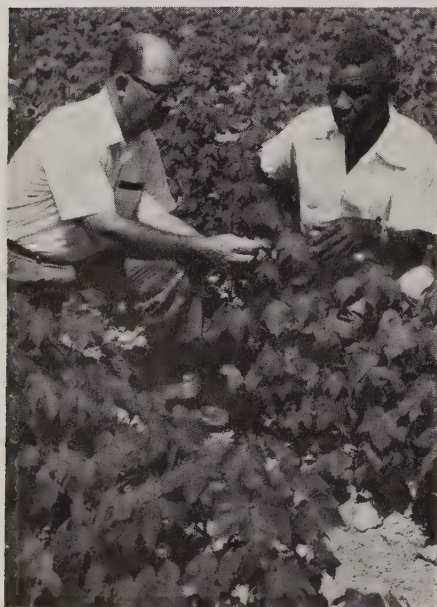
Grain and hay in excess of livestock needs are sold for cash in-

come in addition to his other crops. Seventy-three acres of grassland furnishes grazing for the cattle.

Tolbert, his wife Mamie, and the two boys, ages 11 and 12, run the farm with little outside labor. Mrs. Tolbert does such jobs as driving the tractor during haying season.

The family is active in community affairs and makes good use of Agricultural Stabilization and Conservation Service and Extension Service programs.

A successful farmer and a good citizen, Joseph Tolbert was recently appointed to the local Farmers Home Administration Committee for a two-county area.—T. D. ALLREDGE, *Work Unit Conservationist, SCS, Greenwood, S. C.* ♦



Joseph B. Tolbert (r.) with FHA Supervisor Dan Gambrell discusses his diversified farming program.

City Water Supply

The public water supplies of the 100 largest cities in the United States serves 9,650 million gallons of water a day to 60 million people. ♦

The Gold Seal Award to Scouts For Conservation Activity

By **Joseph M. Robertson**
Assistant Secretary of Agriculture

I AM HONORED to be here today—to represent Secretary of Agriculture Orville L. Freeman—and to salute one of your councils: The Narragansett Council of the Boy Scouts of America.

Twice in the past 5 years the Narragansett Council has won the Department of Agriculture's Green Seal award for regional excellence in conservation work. Now, it receives the Department's highest recognition—the national Gold Seal award for the most outstanding conservation work by a Scout Council anywhere in the Nation during the past year.

Congratulations! You have compiled a record unequalled in the brief history of this award.

While we honor the Narragansett Council in particular, I understand there has been increased conservation activity in all of the scout councils. This is reflected in the number of soil and water conservation merit badges awarded in this region.

This increased conservation activity bodes well for the future, because each of you is a member of a team—a team of private citizens and public servants who are working together to improve and restore the great American out-of-doors.

When this was the land of the Narragansett, the Mohawk, the Iroquois, and the Seneca, there was untouched beauty to be found at every turn—in the rugged sweep of the seacoast, in the majestic mountains, in sparkling, clear streams, and in the breath-taking

natural beauty of your forest lands.

Much of that beauty has been spoiled or squandered because at the time it seemed so inexhaustible.

We know *now* that belief was false.

Now we must work overtime to erase blight and retain the beauty of our outdoor heritage or it will slip from us forever.

We find ourselves in the position of the Red Queen in "Alice Through the Looking Glass" when she said: "Here it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that."

But we must do more than run faster. We must enlist others in the conservation cause.

We must make them understand that conservation is an active, dynamic, constantly changing thing, but that it always has only one goal—to make our mountains, our seashore, our soil, our water *serve* people.

The purpose is *use*.

Use that restores the spirit, like watching a chill morning mist swirl across a lonely campground as you sip a warming mug of hot chocolate.

Use that brings pleasure, like the thrill of seeing a doe and her fawns dart across a forest trail.

Use that provides jobs, like a mountainside girded with ski lifts that provide new sources of income and new economic opportunities for the resort owner, the motel operator, their employees, and the people of the area.

Use for profit, like the conservation cropping system that helps American farmers produce better

food at less cost to the consumer than farmers in any other Nation in the world.

Use that serves a community, as a watershed project can provide the water to service a municipal water system.

We *need* to create a better understanding of our aims and goals.

In the words of President Johnson, a new conservation is required to deal with these new problems. A conservation that involves not only protection and development, but restoration and innovation. A conservation that is concerned not with nature alone, but with the total relation between man and the world around him.

You can contribute mightily to this total relationship by promoting conservation in the schools . . . by informing friends and neighbors and adult civic organizations of the ways that conservation contributes to their enjoyment of the out-of-doors . . . and to the national well being.

Since the Boy Scout movement does much to instill in our Nation's youth a deep and lasting appreciation of nature, you are a natural and important partner in the conservation movement.

The Department of Agriculture would like to see this partnership strengthened. That is why we created a series of awards to recognize the work you do to fight erosion, to reforest blighted regions, to prevent forest fires, to improve wildlife areas, to develop recreation sites, and to promote conservation and wise use of our natural resources through your educational programs. The first regional Green Seal awards for conservation excellence were made in 1961. Then, in 1962, we created the national Gold Seal award to afford greater recognition to your efforts.

Now, it is my great pleasure to present to your representative, the national Gold Seal award for 1965. ♦

This statement was made in awarding USDA's Conservation Gold Seal to the Narragansett Council of the Boy Scouts of America at Portsmouth, N. H., Oct. 16, 1965 (*Soil Conservation*, September 1965).



CONSERVATION PROFILE

Dr. Daniel Hale

West Virginia

Conservation and health are doctor's concern

A DOCTOR who sees the connection between soil and water conservation and the healing of the ill has been honored by the citizens of Mercer County, W. Va., by giving his name to the largest dam in their small watershed project.

He is Dr. Daniel Hale, who has been the driving force behind the creation of one of the Nation's outstanding watershed projects on Brush Creek in the Southern Soil Conservation District.

Until 1947 Dr. Daniel Hale was a quiet, unassuming general prac-

titioner in his hometown of Princeton, interested on his off hours in gardening and his hobby of hybridizing daylilies.

With a few Christmas trees planted on a 15-acre tract according to the recommendations of the Soil Conservation Service, the doctor had his first taste of success in conservation. Encouraged by the experience, he was soon the owner of more than 170 acres covered with trees.

As a cooperater with the Southern District, the doctor built four farm ponds, constructed diversion terraces and access roads, and seeded the critical areas of his farms.

Concern for health

At the same time he became interested in the relation between soil and water conservation and the environmental health of the community. He recognized in Public Law 566 a means of improving public health by controlling the floods that struck the community annually and created a health hazard.

After preliminary discussions with local citizens, Dr. Hale and



Dr. Hale (c.) as head of two watershed associations joins SCS engineers, Clement Crowe (l.) and Arthur Holland (r.), in the field as they gather information for plans.

a few associates worked day and night to obtain the easements needed on 200 pieces of property for the construction of 3 flood-retarding structures and 6,610 feet of channel improvement in the Dave's Fork - Christian's Fork Channel watershed.

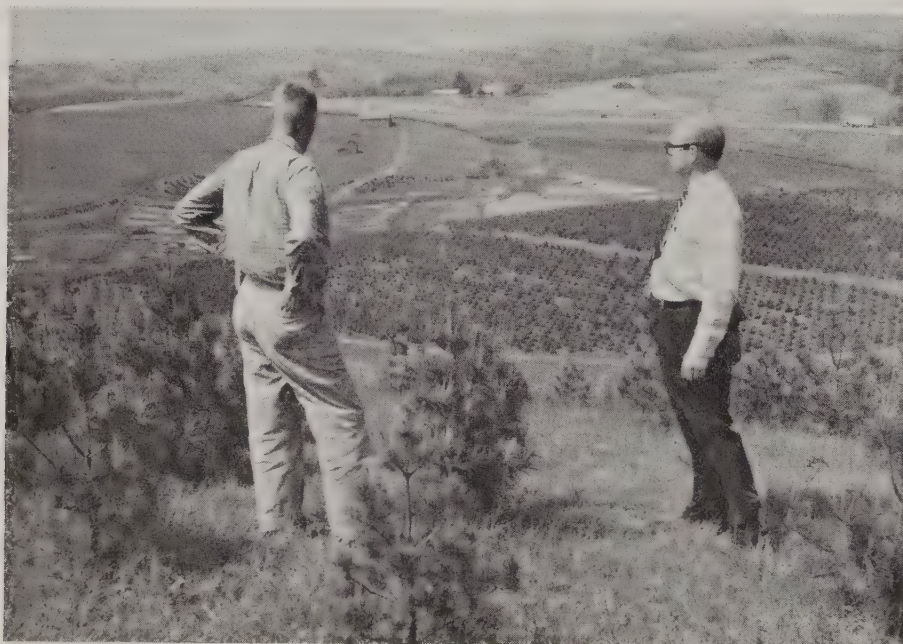
In spite of many frustrations, disappointments, and the irritation of a few condemnation suits, the project was successfully completed and gained statewide attention.

Dr. Hale, who now had some converted "believers" on his side, started on a much larger project. The Brush Creek watershed covering some 22,293 acres and containing 11 structures and 6 miles of channel improvement, was approved in 1960.

Safe water supply

Again the doctor and his followers plunged into the battle of acquiring land easements. One of the main objectives of Dr. Hale's plan was to obtain a safe, adequate supply of water for Princeton. At that time the city depended on wells and had suffered several water shortages. He also envisioned one of the reservoirs serv-

Dr. Hale (r.) looks over his Christmas tree plantation with SCS Work Unit Conservationist Jack Myers.



ing the growing area of Green Valley-Glenwood Park in the center of the watershed. In addition he noted that recreational facilities were needed in the county.

With these three things in mind he approached the Princeton officials and persuaded them to enlarge one of the proposed flood control dams to provide water-supply storage. The Farmers Home Administration provided a \$1 million loan to make this possible.

He encouraged and supported the formation of the Green Valley-Glenwood Public Service District to combine a new water supply and central sewage disposal system with plans for another of the flood-water retarding dams. Now almost 1,000 residents are being served by the facilities financed in part by Federal grants and FHA loans.

Dr Hale then encouraged the Mercer County Court to develop another one of the dams into a 55-acre lake to be used for recreational purposes. He used his influence to get approval by the county voters of a \$157,000 bond issue for this purpose.

Still more to do

Dr. Hale does not feel that his job has ended with the completion of the Brush Creek project.

He has persuaded the county court to set up a county water conservation committee to plan orderly construction of additional dams for flood prevention, water supply, and recreation to benefit all the people of the county. The court made him chairman of the committee.

In addition to his watershed activities, Dr. Hale is a member of the West Virginia Christmas Tree Growers Association; president of the Mercer County Board of Health; supervisor of the Southern Soil Conservation District; chairman of the Princeton Water Resources Committee; member of the Northeastern Forest Experiment Station Research Advisory Committee; and is still gardening. ♦

Misplaced Mrs.



Mrs. Sue Dunn, mistakenly identified as an "Arkansas miss" when her picture appeared on the cover of the October *Soil Conservation*, is in fact clerk for the Dorcheat Soil and Water Conservation District, Minden, La.

She was helping publicize the outstanding woodland conservation program of the district, also described in the October issue, when the photograph was made. Through a clerical slip, the print was identified as coming from the Lafayette County District in Arkansas.

On her own time, Mrs. Dunn is an enthusiastic conservation worker. She is a popular speaker before women's and civic clubs. Her father, James R. Stewart (deceased), was a member of the original board of supervisors of the Dorcheat district when it was organized in 1938.

Both districts can be justly proud of their stately pines and beautiful girls, but we are glad to have our cover girl correctly located in the district she serves so graciously.—Ed. ♦



Soil Conservation in Perspective. BY R. BURNELL HELD AND MARION CLAWSON. 1965. *Johns Hopkins Press, Baltimore (for Resources for the Future).* 344 pp., charts and maps. \$7.50.

One in a continuing series of inquiries by *Resources for the Future* into America's resource problems, this book is an appraisal of the soil conservation movement since the early 1930's.

The analysis is presented against the background of a brief history of the larger conservation movement that began around the turn of the century and concludes with an inquiry into the proper nature of soil conservation in a changing future.

The key to the meaning of the book is in its title: "Soil Conservation in Perspective."

The reader must ask first, "whose perspective,"? for it is a well-known natural law that the perspective of any scene is determined by the position from which it is viewed.

The perspective delineated here is that of the economists of *Resources for the Future*. Proceeding from the definition of "conservation" that includes only those measures that "maintain basic productive capacity of soils" without "building new or additional capacity," the authors label much of the going soil conservation programs of the Department of Agriculture as contrary to the public interest. In so doing, they imply that the emphasis of the original Soil Erosion Service should have prevailed for all time!

The attempt to assess the effect of soil conservation activities on agricultural production proves frustrating as the authors seek to categorize each practice as "maintaining" or "increasing" produc-

tion, only to find that most of them may have both effects simultaneously. They fail, however, to consider the compensating effects of practices *used in combination*, as they invariably are in modern conservation programs.

The authors' concern with individual practices, rather than the total conservation treatment of land areas, reveals how out-of-touch they are with today's on-going conservation operations. It ignores the growing attention to the connection between *soil* and *water* management and to the orderly land use adjustments that have been a predominant part of soil conservation district and SCS programs for many years.

An evaluation based on such a picture of soil and water conservation operations cannot give any real appraisal of their net effect on current agricultural production. Nevertheless, the authors hold to the viewpoint that programs to improve the efficiency and preserve the productivity of the Nation's land resources are in conflict with the effort to support farm income by restricting production.

This viewpoint might suggest that the way to solve the "surplus" problem is to induce inefficiencies by withholding improved technologies and withdrawing technical assistance, including research. Would it then follow that the public would be better served by greater losses from erosion, drought, floods, and poor drainage, and by reduced production as a result of continued cropping of unsuited land rather than putting it into trees, grass, or adapted non-farm uses?

Obviously, this would not be in the public interest. At many points in the book the authors recognize that it would not, and when they come in the final chapters to define an "ideal" conservation program for the future they conclude largely with a series of unanswered questions.

The book does bring together an

impressive collection of facts about the Nation's conservation effort and presents them in a provocative manner. Whatever the reader's point of perspective, he surely will agree with the general thesis that there are many changes in store, and soil conservation must adapt to "the changing future."—GLADWIN E. YOUNG, *Associate Administrator*.

Regions, Resources, and Economic Growth. BY HARVEY S. PERLOFF, EDGAR S. DUNN, JR., ERIC E. LAMPARD, AND RICHARD F. MUTH. 1960. (*Reprinted 1965.*) *University of Nebraska Press, Lincoln.* 716 pp., maps, charts, paper. \$1.95.

This reprint of a *Resources for the Future* study first published by Johns Hopkins Press makes easily available a vast amount of information about our country's resources and its economic growth and development analyzed by regions and by industries.

Population trends, employment, income, and the use of resources are the factors used to show economic growth. The industries are grouped as agriculture, manufacturing, mining, forestry, fisheries, and services. These six broad categories are considered in relation to each other to show how our resources have been used, what changes are occurring, and where further adjustments may be expected. Economists and resource conservationists will find valuable information and insights on the relationships of natural resources to economic growth.—T. A. NEUBAUER, *Resource Development Division, SCS, Washington, D. C.*

New Publications

Autumn Olive for Wildlife and Other Conservation Uses. BY PHILIP F. ALLAN AND WILMER W. STEINER. 1965 (rev.). USDA Leaflet 458. 8 pp., illus. This leaflet, considerably revised, describes, the uses, planting and care, planting stock sources and production, and seed production of autumn olive. It also gives the history of autumn olive, what it is, and where and how it grows,

along with a map showing zones of adaptability. Included is the first published description of Cardinal autumn-olive, a new variety developed by the Soil Conservation Service. It is characterized by rapid establishment, winter hardiness, and the production of an abundance of colorful fruit.

A Chronology of American Agriculture, 1790-1965. PREPARED BY AGRICULTURAL ECONOMIC RESEARCH SERVICE. 1965. USDA. Wall Chart 48x30 in., folded 8x10 in. A listing of major economic, political, social, and legislative events and trends arranged for easy reference on a time scale.

Improving Cattle Distribution on Western Mountain Rangelands. BY JON M. SKOVLIN. 1965. *USDA Farmers' Bul.* 2212. 16 pp., illus. Suggestions on ways to avoid range depletion by improving distribution of grazing on land of uneven character.

Public Land Statistics 1964. 1965. U. S. Dept. Int. Bur. Land Management. 203 pp., illus. Tabulation of the land area and its use, management, and protection.

Soil Surveys

Merrimack County, New Hampshire. BY HARVEL E. WINKLEY. 1965. 94 pp., illus; maps 3.17 inches to the mile (1:20,000). Soils surveyed by Harvel E. Winkley, Dirk Van Der Voet, Frank J. Vieira, Edward F. Hutchinson, Theodore L. Kelsey, Anthony D. Hamilton, Sidney A. L. Pilgrim, and Bradford Higgins.

Amador Area, California. BY HAROLD R. SKETCHLEY. 1965. 167 pp., illus; maps 3.17 inches to the mile (1:20,000). Fieldwork by Grant M. Kennedy, Harold R. Sketchley, Lawrence E. Welch, John H. Rogers, Paul G. Nazar, and David C. Estrada.

Calhoun County, Mississippi. BY J. W. McMULLEN, J. S. HUDDLESTON, CHARLES BOWEN, AND R. E. DAVIS. 1965. 65 pp., illus.; maps 4 inches to the mile (1:15,840).

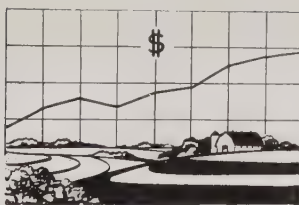
Hockley County, Texas. BY DARRELL G. GRICE, WILTON GREEN, AND WAYNE RICHARDSON. 1965. 65 pp., illus; maps 3.17 inches to the mile (1:20,000).

Nueces County, Tex. BY GUIDO E. FRANKI, RAMON N. GARCIA, BENJAMIN F. HAJEK, DANIEL ARRIAGA, AND JOHN C. RORERTS. 1965. 65 pp., illus.; maps 3.17 to the mile (1:20,000).

Thomas County, Nebraska. BY LESTER E. SHERFEY, CHARLES FOX, AND JOHN NISHIMURA. 1965. 44 pp., illus; maps 3.17 inches to the mile (1:20,000).

From the Administrator:

Economics and Conservation



HELPING PEOPLE through locally organized efforts and leadership to make judicious use of the soil, water, and related resources at their disposal is the business of the Soil Conservation Service.

It is important and challenging work. It requires the development of resource conservation plans—both broad and specific in scope, long-range and short-term in time scale.

Both physical and economic yardsticks must be correctly applied in estimating the probable effects of alternative land and water uses being considered and in evaluating the results of the decisions carried out.

Many things motivate people to use and treat their natural resources the way they do. Each family and each community must determine its own objectives.

One of the most powerful motives in farming, ranching, or other uses of land and water today is to achieve a satisfying standard of living of the individual. Likewise, communities seek improved economic activity in order to sustain and support community services, facilities, and institutions at a desired level.

Although economic considerations do not dominate every decision on resource development and use, they do play an important part. In fact, economics is so important in the work of the Soil Conservation Service that it is “a thread that runs through the whole garment.” That is to say, every SCS conservationist, whatever his specialty, must be knowledgeable and skillful in the use of economic facts and principles.

No professional conservationist measures up to the requirements of

his job until he can help people make practical application of economic information necessary for sound long-term decisions and actions to achieve conservation objectives. The fact is, the SCS conservationist is not in a position to point out practical alternatives until he understands both the physical and economic consequences likely to result from the adoption of those alternatives.

Anyone who influences people, individually or collectively, in the use and treatment of soil and water resources influences the costs and returns that result from the actions taken. It is important that Service employees encourage and help the decision-makers weigh carefully during the planning process the probable economic effects of each promising objective. This does not necessarily mean seeking the highest dollar return in every case, but rather to be sure that the conservation objectives can be reached without economic loss or with an improved net return in the long run.

Being able to foresee the effects of land use changes and of recommended conservation practices on the self-interests of the land owner or user enables the conservationist to give sympathetic consultation while encouraging actions in the public interest.

If these criteria are met, the decisions reached will be more soundly based, more apt to be carried out, and more rewarding to all who have invested in the resource development.

Economic information pertinent to resource conservation is needed and used in varying degrees by different people, depending upon their objectives, needs, and available resources. And individuals

vary greatly in their knowledge of and ability to use economic information. That is why SCS men must be in a position to help with conservation cost and return considerations to the extent needed by each individual or group.

And that is why it is Service policy to develop and keep current useful cost and return information and estimates in each work unit technical guide.

It is not sufficient, however, simply to have this information in our set of everyday working tools; we must learn to adapt and use it wisely in helping people reach right decisions.

While some investments in conservation improvements may not be rewarding to the individual owner, they are necessary to safeguarding, protecting, and enhancing community or area resources in the public interest. Community and public investments in such instances become necessary to reach group objectives.

There is an ever-increasing need for information on the economic impact on a community, a district, a State, and the Nation of investments in conservation improvements. Such information should be developed to show total investment costs and those annually occurring, the cumulative effect on net returns, and the multiplier effect on the economic health of the community and its institutions.

This is not a job for SCS to do alone. Rather, it is one in which we should encourage and help others who may be better prepared to evaluate the economic effects of conservation.

More people, especially urban leaders, need to understand that both public and private investments in resource conservation have strong public benefits and are essential to national growth and welfare. They frequently need better and more comprehensive facts to help them reach such understanding.

D. A. WILLIAMS



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Conservation Farm Creates Beauty

Story on page 136



Striperopped tobacco and corn on the slopes and improved pasture of lespedeza, white clover, fescue, and bluegrass in the valley have

rewarded James Watkins' efforts to restore a rundown century-old estate in the Boyle County Soil Conservation District, Ky.

His harvest is not only a profitable farm enterprise but a vista of beauty in the place of gully-scarred slopes and eroding streambanks. ♦

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Soil Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

Hunoycutt

Belchley

Hagen

Ahstrom

Delker

Grazing Lands

Pages 147, 155

Range Conservation

Pages 149, 151, 153, 168

SCS ACTIVITIES 1965

Page 159



SOIL
CONSERVATION
SERVICE

U. S. DEPARTMENT
OF AGRICULTURE



Grazing . . .

Grazing by livestock perhaps impinges on more of the earth's surface than any other potentially damaging effect of man's occupation and use of the land.

A systematic approach to grazing management in every corner of the land, whether grassland or not, would, therefore, be a major advance in conservation technology.

Such an approach is now provided in SCS's recognition of five distinct types of grazing land, embracing the full scope of vegetation types and forage plants, as defined (p. 155) for us by Range Conservationist Bob Williams and Agronomist Burdette Blakely.

SCS conservationists are being trained to appraise all kinds of local grazing lands and advise owners on their safe and profitable use in every section of the country.

Progress: Data on the amounts of individual practices applied (p. 162) give only a hazy notion, at best, of real progress in soil and water conservation.

What counts is the use on each tract of land of the *combination* of practices required to obtain the desired results.

Our reporting system now gives us, for the first time, a record of identifiable areas where the planned combinations have been applied.

The first returns, possibly incomplete, show less than half the planned acreage "adequately treated" (p. 162).

This measure complements the Conservation Needs Inventory in showing the size of the unfinished conservation job.

COVER: South Dakota Rancher Tom Boylan watches a herd of 700 steers move in on an 1,800-acre pasture that has been deferred all summer (story on back page).

Soil Conservation

Devoted to the wise use of land and water resources

FEBRUARY 1966

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Natural associations of plants on different range sites reflect differences in local environments.



JOINT FIELD studies of range soils by a team consisting of a range conservationist and a soil scientist are making possible better interpretations of soil surveys on rangeland.

With better understanding of the relations between soil and climate on the one hand and natural plant cover on the other, conservationists and ranchers or livestock farmers can translate the soil surveys in terms significant to ranch management.

The Soil-Range Investigations Project of the Soil Conservation Service was activated July 1, 1957, with headquarters at Salt Lake City, Utah. Its purpose is to determine the soil, climate, and vegetation characteristics that consistently occur together under natural conditions.

Plant communities

On any natural land area, different species of plants are grouped together on areas that satisfy their growth requirements. Such groups of plants are known as plant communities. Under natural or undisturbed conditions, these communities are the potential or climax vegetation of the areas.

Range "sites" are designated to express differences in the inherent productive capacity of different

Range Soil Studies

SCS team gathers data on sites to help interpret surveys

By Erasmus W. Williams and Vern K. Hugie

Range Conservationist and Soil Scientist, SCS, Salt Lake City, Utah

kinds of rangeland. A range site in its simplest definition is an area having a potential for producing essentially the same kind and amount of vegetation. Each range site has its own combination of environmental conditions that results in a distinctive plant community.

If all rangeland supported its potential (climax) vegetation, range sites could be quickly identified, and the kind and amount of their production readily determined by study of the vegetation alone. Unfortunately, most rangeland does not now support its potential vegetation.

Changes from the potential plant community of a range site are reflected in the range "condition." Vegetation essentially the same as

the potential is classified as in "excellent" range condition. That containing few or none of the plants found in the potential community is classified as being in "poor" condition.

As the range condition declines, it becomes increasingly difficult, and finally impossible, to recognize range sites by their plant communities. Without the potential plant cover, sites must be identified and their potential for production evaluated on the basis of more permanent mappable features of the landscape, such as the soil.

Soil variations

Observation of a great many soils and the native vegetation associated with them indicates that the soils exhibit more variation

than the vegetation they support. This presents a problem in determining what soil taxonomic units, for practical purposes, should be grouped together in a single range site.

To plan for the maximum sustained production of high quality forage, the range manager must know what the potential plant communities of his rangeland are. He needs to know how much and what kind of vegetation each site is capable of producing. The potential plant community usually is a goal towards which management may be directed and is also a criterion for the evaluation of range condition.

Locations selected for study in the soil-range investigations are confined to areas of relict range vegetation that have been little affected by man's activity, such as grazing by livestock, cultivation, or fire, or areas that have been protected from such activities for a long period of time. The vegetation of such areas is considered representative of the potential production of the study locations.

Studies to date have been directed toward (1) the development of methods for evaluating the vegetation of relict plant communities, including total annual yield; (2) environmental factors (soils, climate, etc.) consistently identified with specific communities; and (3) measurements of the annual variations in the kind and amount of vegetation produced on selected locations.

Study locations

Study locations were selected only after extensive reconnaissance in which hundreds of tracts of rangeland were examined, evaluated, and cataloged. Studies are located on soils that are extensive in area, or on soils that bracket the significant variations in the general locality.

Detailed studies have been conducted on 84 locations in southern Idaho, northern Utah, northeastern



Range conservationist collects plants from study plot and sorts them by species into paper bags supported by a metal frame. Another metal frame outlines the sample area.

Nevada, southwestern Colorado, and west central Wyoming.

At each location, the current year's growth of vegetation is estimated, clipped, and weighed by species from three closely spaced 9.6-square-foot plots, located on an area selected as having average vegetative cover for the study location. In addition, total annual yield by species is estimated and recorded on 20 random plots of the same size. Estimates on the 20 plots are then adjusted on the basis of the differences between the estimated and actual weights recorded for the clipped plots. Clipped material is then air-dried and all measurements reduced to air-dry weight.

A soil pit is dug to bedrock or below any indication of soil development in the area of the three clipped plots. Each profile is examined and described according to the procedures outlined in the Soil Survey Manual. Detailed notes are recorded on soil surface features, soil fauna, root systems, and the like. Soils at each location are

correlated and classified into the national classification system. Selected soil profiles are subjected to laboratory analysis.

Photographs in both black and white and in color are made, including the general landscape, close views of the vegetation, and the exposed soil profile.

Notes include a general description of the study area; the size, vigor, growth habit, relative abundance, and distribution of the principal plant species; and a list of all plant species found in the study area.

Climatic data

Weather records from recording stations are analyzed and interpolated for each study location. Since most study locations are not near weather stations, supplemental precipitation gages were located adjacent to selected studies. Soil moisture samples are also collected periodically at selected locations to assist in determining moisture available for plant growth.

To provide more reliable infor-

mation on the range of fluctuation that occurs in the kind and amount of vegetation over a period of years, continuous total annual yield records are being maintained at 17 selected locations. Yield records have been collected for 8 years at 10 locations, 7 years at 5 locations, and 6 years at 2 locations. In addition to these, more than one season's yields have been measured at 31 other study locations. Total annual yields by species have been recorded for more than 5,000 plots since the project began.

In addition to in-Service reports and papers presented at local, State, and national meetings, nine articles reporting on the project's activities and findings have been printed in journals of national circulation:

Application of Soil-Climate-Vegetation Relations to Soil Survey Interpretations for Range Lands. Jour. Range Mgt. (15)3: 162-166. May 1962.

Sagebrush on Relict Ranges in the Snake River Plains and Northern Great Basin. Jour. Range Mgt. 15(5): 273-278. Sept. 1962.

Variation in Bluebunch Wheatgrass in Relation to Environment and Geographic Location. Ecology. 44(1): 158-161. Winter, 1963.

Some Plant-Soil Relationships on an Ungrazed Range Area of Southeastern Idaho. Jour. Range Mgt. 16(3): 113-118. May 1963.

Cicadas and Their Effect Upon Soil Genesis in Certain Soils in Southern Idaho, Northern Utah, and Northeastern Nevada. Soil Sci. Soc. Amer. Proc. 27(1): 78-82. Jan.-Feb. 1963.

Fluctuating Herbage Production on an Ungrazed Sierozem Soil in Idaho. Jour. Soil and Water Cons. 18(1): 8-11. Jan.-Feb. 1963.

Soil Taxonomic Units and Potential Plant Community Relationships in a Pristine Range Area of Southern Idaho. Amer. Soc. Agron. Spec. Pub. 5: 190-205. Oct. 1964.

Herbage Production and Composition Fluctuations of Natural Plant Communities as Related to Climate and Soil Taxonomic Units. Amer. Soc. Agron. Spec. Pub. 5: 206-221. Oct. 1964.

Soil Surface Patterns of Some Semiarid Soils in Northern Utah, Southern Idaho, and Northeastern Nevada. Soil Sci. Soc. Amer. Proc. 28 (6): 786-792. Nov.-Dec., 1964. ♦

Dairy cattle grazing longleaf pine range during early spring find nutritious forage that fills a gap in tame pasture at this time of year.

Forage From Pine Woodlands

Native plants fill gaps in grazing schedules for dairy and beef cattle

By Francis J. Ezernack

Work Unit Conservationist, SCS, DeRidder, La.

FORAGE produced on pine woodlands is an important resource in the South. Planning the use of grazable woodlands in a way to make use of this forage without damaging their woodland values is an important part of total conservation plans for southern farms.

The situation in Beauregard Parish, a part of the Calcasieu Soil and Water Conservation District in southwest Louisiana, is typical of many areas throughout the Southern Coastal Plain.

Most of the 600,000 acres of pine woodland, which is about 80 percent of all the land in Beauregard Parish, is being grazed by livestock.

Until recently, this area was all open range. Because of extensive reforestation in the past 10 to 12 years, much of this land has been fenced. Although much of it is owned by large companies that do not own livestock, most of it is

still being grazed.

There are about 50 dairy operations in the parish, and about 300 other livestock operations. Approximately 90 percent of them use grazable woodland. For many, it is the primary source of forage.

This native forage is important to dairymen. Some are so situated that they can lease grazable woodland, and others own woodland that can be grazed. They use the woodlands to fill out their year-round forage needs.

Grazable woodland provides a cheap source of adequate forage for dry dairy cows and replacement heifers, which do not need the high quality required for milk-producing cows. The animals are fed supplements when the woodland forage is dormant.

Grazable woodland is a good place to keep livestock during drought, when tame pastures are



short, and during extreme wet weather. Woodland forage suffers less from drought than improved pasture. Some dairymen consider it as insurance against dry weather. At other seasons, when the ground is extremely wet, the use of grazable woodland prevents excessive damage to tame pastures by trampling and bogging.

Spring and fall gaps

Two major gaps occur in the grazing program that most dairymen follow. One is in the late spring, April 15 to May 15, when winter pastures of oats, rye, and wheat are coming to an end. Then, fields are plowed and planted to millet, sudan, sorghums, and summer peas for summer grazing. During this period forage in woodlands is in peak condition.

The other gap occurs about September 15 to October 15. At that time, fields are being prepared and planted to oats and rye for winter grazing. Then, dairymen again can use grazable woodland if it is available.

The forage plants in woodlands generally improve under this schedule because they are deferred 4 to 5 months every summer.

Beef cattlemen also use grazable woodlands to help fill out their forage programs. Their herds are rotated between woodlands and improved pasture during the summer while hay is being made on improved pastures.

The woodlands provide shade in the summer and shelter from winter cold. Many beef cows drop calves while in the woods in the winter. In the spring, the cows and calves are moved to improved pastures. By this time, the calves are large enough to graze and utilize the increased milk flow from their mothers. This results in fast growth.

Another group of ranchers that make good use of woodland forage are those operating on the salt marshes along the Gulf Coast. They use the grazable woodland during the summer, from April



Improved pasture of ryegrass, white clover, coastal bermudagrass, and bahiagrass provides abundant winter forage. This picture was taken in January.

15 to October 15, when use of salt marsh is hazardous, because of mosquitoes and deer flies and the possibility of hurricanes. Beef cattle make gains on woodland forage during most of this period. The summer deferment of marsh range helps to maintain it in good condition and assures abundant forage for winter use.

When livestock are moved back to the marsh for the winter and early spring, the woodlands in turn get a 6-months' rest, permitting the forage plants to store plant food for spring growth.

Proper grazing is the key to success in all these forage programs. The primary use of most of the grazable woodland acreage is for timber production; use of the forage is secondary.

Conservation plans developed with Soil Conservation Service assistance provide for grazing use of woodlands that will protect both forage and timber crops, conserve soil and water, and give sustained yield. The combined use of the different grazing resources means more efficient forage harvest and better returns. ♦

Beef cattle graze pine woodland in July while hay is being made on tame pastures. Stock will be returned to tame pasture when woodland forage matures.





Saw-palmetto, a low palmlike shrub, is a problem on 25 million acres of native grazing land in Florida.

Brush Control Takes Unusual Form On Florida's Saw-Palmetto Ranges

By Lewis L. Yarlett

Range Conservationist, SCS, Gainesville, Fla.

RANCHERS in soil conservation districts in south Florida are applying brush control as a conservation practice to an un-

usual and different situation—the semitropical saw-palmetto savannahs. Basic principles are much the same as those used in controlling invading brush on western ranges, but the plants are different.

Saw-palmetto (*Serenoa repens*) is a perennial, shrubby member of the palm family that grows abun-

dantly on the rangelands of central and south Florida. It has a creeping stem about 4 to 6 inches in diameter with a large number of roots on the under side. The stems are branched and often extend along the surface for 30 feet or more.

The ground cover of the stems and fronds varies from sparse to impenetrable thickets. Many of the native grasses are found growing within the protection of these plants, but due to competition for light, moisture, and nutrients, they are low in vigor.

Creeping bluestem (*Andropogon stolonifer*) is the most important of these grasses. In poor condition ranges where saw-palmetto is abundant, creeping bluestem produces only 150 to 200 pounds of forage an acre.

Approximately 25 million acres of grazable woodland and rangeland are heavily infested by saw-palmetto. Historical notes and experiences of early-day ranchers indicate that the little palm occupies more acreage today than it did 75 years ago.

Ranchers in south Florida are obtaining 80 percent control of



Two roller choppers hooked in tandem behind a crawler tractor cut stems and terminal shoots of saw-palmetto.

saw-palmetto by cutting brush one time over with two heavy-duty roller choppers hooked in tandem. Chopping is done in the period from December through March, at an approximate cost of \$4 to \$5 an acre. The treated range is deferred for a complete growing season, usually through November. Fringe areas around marshes,

ponds, and major drainways are left undisturbed for wildlife cover and shelter for livestock.

Forage production by creeping bluestem commonly increases to 1,600 pounds an acre green weight in 3 months and to 6,000 pounds an acre in 11 months after chopping. Quail and turkey normally increase on treated range. ♦

Plans for 10 New RC&D Projects Stress Recreation, New Markets

THE DEVELOPMENT of recreation facilities and expansion of markets for local products are major features of 10 new Resource Conservation and Development Projects authorized by the Secretary of Agriculture to receive USDA assistance in planning after funds for this purpose were included in the 1966 Department of Agriculture appropriations act.

The projects cover more than 21 million acres. They bring to more than 38½ million acres the combined area of 20 approved projects now receiving assistance through the RC&D program administered by the Soil Conservation Service.

The new project areas and the principal objectives of their sponsors are:

Tradewater River Area, Kentucky—1,718,000 acres in Christian, Hopkins, Caldwell, Crittenden, Webster, and Union counties. Development of 13 watershed projects under Public Law 566, recreation development on public and private land, control of salt marsh mosquitoes, and abatement of water pollution.

Hull-York Lakeland, Tennessee—2,578,480 acres in Clay, DeKalb, Fentress, Jackson, Macon, Overton, Pickett, Putnam, Smith, Cumberland, and White counties. Multiple-use development in small watershed projects, wood products industries, and markets for Christmas trees, greenery, and edible nuts.

Little Kanawha Area, West Vir-

ginia—1,138,130 acres in Calhoun, Roane, Ritchie, Wirt, and Wood counties. Reduction of flood damage, increased water supplies for area development, reforestation and improved woodland management, and markets for wood crops.

Ozark Highlands Area, Oklahoma—1,325,440 acres in Adair, Cherokee, and Delaware counties. Recreation development, marketing and storage facilities for fruit, berry, truck, and nut crops, and for hardwood timber products, and expansion of commercial plant nurseries on family farms.

St. John-Aroostook, Maine—2,721,733 acres in Aroostook and part of Penobscot counties. Recreation development, improvement of forest resources, and local processing and marketing facilities for agricultural and forest products.

Top of the Ozarks Rivers, Missouri—2,970,880 acres in Dent, Howell, Oregon, Shannon, and Texas counties. Improved timber management, reduction of flood and sediment damage, water supplies, and recreation development.

Arkansas River Valley Area, Arkansas—3,676,800 acres in Sebastian, Scott, Crawford, Franklin, Johnson, Pope, Yell, and Logan counties. Improved recreation resources and woodland management, retraining displaced farm people, and increasing employment opportunities.

Bitterroot Valley, Montana—

1,800,760 acres in Ravalli and part of Missoula counties. Increasing tourism and expanding industrial developments.

Coosa Valley Area, Alabama—1,676,500 acres in Calhoun, Clay, St. Clair, and Talladega counties. Development of recreation and tourism, expansion of markets for wood crops, increased farm income, and industrial and commercial employment.

Southeast Delta, Mississippi—1,474,166 acres in Humphreys, Leflore, Sunflower, and parts of Carroll, Holmes, and Yazoo counties. Flood prevention and improved water management, recreation development, and tourism. ♦

American Conservation Congress in Brazil

Resource conservation problems, techniques, and progress in the Americas will be reviewed April 12-29 at the First Pan-American Congress of Soil Conservation, to be held in Sao Paulo, Brazil.

The Congress is sponsored by the Brazilian Ministry of Agriculture and the Agricultural Secretary of the State of Sao Paulo. Several nations are represented in developing and participating in the sessions.

Prominent authorities from government agencies and colleges in the United States and other Western Hemisphere countries are being invited to address the plenary sessions.

The Congress program also will include 6 sections dealing with various phases of the conservation field, with 20-minute presentations on 32 different topics. A number of field trips and social programs also are being planned.

Papers will be presented in three languages—English, Spanish, or Portuguese. At the beginning of each session, mimeographed copies of the papers will be given to participants.

After the close of the Congress, a Proceedings will be published. ♦

MOST RANGELAND managed for the production of domestic livestock is also used by wildlife. The intentional management for dual use by livestock and wildlife, while not commonplace, is increasing in popularity. The underlying reason is the economic value of wildlife and its income possibilities to ranchers.

On ranches where consideration is given to habitat for deer and wild turkey, the added income amounts to \$.75 to \$1 or more an acre. It is much more on some ranches.

One example is a Texas ranch that is managed primarily for deer and other kinds of wildlife. Here deer numbers are reported to be about one for every 3.3 acres. Hunters coming from a wide area provide a major part of ranch income. On another ranch, hunting rights were returning about twice as much per deer as cattle were yielding per head on the market.

More important than money

On many ranches the charging of a fee for the right to enter for the purpose of hunting or fishing simply serves to augment the ranch income. Owners and operators realized fringe benefits in more rigid control of trespass, less vandalism, good landowner-sportsman relations, and better control over the amount of wildlife that the owner feels should be taken

Dual crops on rangeland . . .

Wildlife and Livestock Can Thrive Together Under Good Management

By Wade H. Hamor and Arnold Heerwagen

Biologist and Range Conservationist, Regional Technical Service Center, SCS, Lincoln, Nebr.

from his land. Many owners consider these more important than the money.

The 1959 Census of Agriculture reported 642 million acres of range and pasture land in farms and ranches of the 48 contiguous States. The vast majority of this is rangeland.

At sometime during the year this land is used by wildlife of one kind or another. The most important are white-tailed deer, mule deer, elk, antelope, wild ducks, turkeys, sage grouse, sharp-tailed grouse, prairie chickens, and quail. Of course, not all rangeland can support all species or kinds of wildlife. The wild occupants of an area are determined by the location of the land, its slope, plant cover, altitude, precipitation, and other factors.

How much competition?

Game birds offer little competition with domestic livestock for forage. Big game, on the other hand, may compete directly. Cattle and elk, for example, may graze

the same range at certain times of the year and compete for grass and other forage. Sheep, deer, and antelope prefer forbs for food and utilize browse plants extensively. Cattle and elk may use these plants as a second choice food and so exert some degree of competition with those animals that are primarily forb users. Cattle graze these plants incidentally on good range, but intentionally on overgrazed ranges.

On northern grassland ranges having only scattered trees and shrubs, cattle destroy much of their value for browse by rubbing against them. Since the browse could be utilized to support larger numbers of deer and antelope, the cattle compete indirectly with game animals on these ranges.

A rancher wanting to maintain or increase his deer and antelope herds will protect segments of land that support browse plants. Fencing is one method of protecting deer browse, and, on many northern ranches, it is the only practical method. If more browse

Elk herd on Philmont Scout Ranch in New Mexico is provided for in grazing plan as cooperator with Eastern Colfax SCD.



plants are needed the fence should be set well away from the established plants. This permits the seeds and suckers of the old plants to invade the area.

Where animals have a preference, cattle, antelope, ducks, and grouse use flat to gently rolling terrain. Deer, turkey, and elk, by choice, occupy the steeper slopes. Land management for a particular species is most successful when applied to the preferred slopes.

Home for antelope

Antelope management includes protecting food plants from damage or destruction by other grazing animals and from overgrazing by the antelope themselves. Control of numbers of both domestic livestock and antelope is required to maintain productive range.

The use of herbicides to favor grass for cattle or sheep must be carefully controlled to protect desirable forbs and browse plants of use to antelope as well as to deer and other wild species.

Management includes a careful evaluation of current seasonal use of food plants. When such an evaluation indicates that choice foods are being overgrazed to the point that the plants are dying or that their vigor is much reduced, overuse is taking place. An immediate reduction in the number of animals is necessary to maintain or improve the carrying capacity of the range.

The presence of open water, such as streams, springs, and ranch ponds, is an important element of habitat. Ponds and springs built or developed primarily for livestock water are needed and used by deer, wild turkey, and waterfowl. Without open water at reasonable distances, the range is uninhabitable by these animals.

Studies have shown that ranch ponds may be important to sage grouse, since nests of these birds are often concentrated nearby.

Sharptailed grouse thrive on rangeland that is lightly grazed

or not grazed at all. Native grasslands cut for hay every other year are productive sharptail range. Stands of dense grasses or grass-like plants are highly important to this bird. The buds of trees and shrubs growing along stream courses and in draws supply winter foods. Wild rose hips are a basic food. Ranchers wanting good numbers of sharptails will manage their rangelands to provide this kind of food and cover.

Wild turkeys occupy the larger and more mature wooded areas on ranges. Nuts, acorns, the seeds of pine, and wild fruit are essential to their welfare. Heavy grazing often damages or removes such habitat.

The combination of ranch ponds and properly grazed rangelands in

the Northern States supply favorite nesting and brood rearing habitat for wild ducks. Several years ago a study was made of such ponds in the range country of South Dakota. It showed that each pond was producing 20 to 23 young ducks each year. The total contribution to the flyway per square mile of rangeland averaged about 26 ducks per year.

Range improvement measures other than grazing management need to be given careful study as to their impact on livestock and wildlife. Without such consideration, measures aimed primarily at improving livestock forage supply may adversely affect wildlife habitat. With appropriate modification certain practices can benefit both kinds of animals. ♦

A Grass Farmer, Not a Cattleman

FRIENDS and business acquaintances of Claude Staples of Brigham City, Utah, and points west are often surprised to hear that he is a "grass farmer," not a cattleman.

"I just use cows to harvest my crop," Staples tells those who ask about his unique way of making a living.

The number of cows bought to do the harvesting depends on the amount of feed available in the fall. This, of course, depends to a large extent on the amount of rain, the grasshopper and army worm infestations, and other factors that determine plant growth. A production check is made each fall, and the amount of forage found determines when and how many cows are purchased.

Staples signed a cooperative agreement with the Northern Utah Soil Conservation District in June 1953. Since that time, he has consulted repeatedly with Soil Conservation Service technicians on how to turn lowgrade land into the lush pastures seen on his ranch.

His busiest seasons are spring

and fall, when he is occupied with raising grass. He irrigates nearly 1,000 acres with about 4 second-feet of water distributed through a series of contour ditches. The Soil Conservation Service helped plan and lay out the system.

About 700 acres formerly in dryland wheat have been seeded to intermediate and pubescent wheatgrass. The grass was seeded with a deep-furrow drill directly into grain stubble in March of the year following the last harvest. The planting was not grazed for 2 years following seeding and is now used only in the winter.

There are 453 acres of native meadow, mostly saltgrass, which provides about 2 cow-months of feed an acre when grazed in the winter.

After the grass has been raised, cattle begin moving onto the ranch from reputable herds in Wyoming and Montana. They are wintered, then sold, usually before March 1, so next year's grass crop is not affected.—BENJAMIN B. HEYWOOD, *Range Conservationist, SCS, Logan, Utah.* ♦

Conservation of Grazing Land

By Robert E. Williams and B. D. Blakely

Head Range Conservationist and Head Conservation Agronomist, SCS

THE PLOW, the ax, and the hoof have been called the three greatest causes of soil erosion and accelerated runoff.

Of these, the hoof—the impact of grazing animals on the land—affects the greatest portion of our Nation's land resources.

Altogether, more than 950 million acres, or more than half the land area of the United States, is used for grazing by domestic livestock.

Management of grazing land in accordance with the needs of the soil and the plants being grazed, therefore, is a big part of the national conservation effort.

Grazing lands occur in all parts of the country. They include 485 million acres of non-Federal land in farms and ranches, 242 million acres of Federal grazing land, 161 million acres of non-Federal forest and woodland, and 65 million acres of cropland regularly grazed as rotation pasture in cropping systems.

Fundamentals

The diversity of grazing land types calls for like diversity in management techniques, although the fundamental principles of encouraging the growth of desirable forage plants, protecting the soil, and conserving moisture apply in all instances.

The experience of the Soil Conservation Service in helping farmers and ranchers plan conservation use of their grazing land, and in applying research findings to their varied problems, has led to recognizing five distinct types of grazing land: (1) Rangeland, (2) grazable woodland, (3) native pasture, (4) permanent tame pasture,

and (5) rotation pasture on cropland. These types are defined and illustrated on the following pages.

Most ranches and livestock farms have at least two, and often more, types of grazing land. Each requires its own adaptation of conservation principles.

Sound conservation plans developed by district cooperators combine the use of the different grazing land resources to provide adequate forage and feed with a margin of reserves to permit timely livestock adjustments needed to protect basic soil and plant resources.

To plan a conservation grazing program a livestock producer must first understand the different kinds of land he has and the capability of each to produce forage. Knowledge of soils, topography, and climate, and their effects on forage production, are important. The operator must also know the important grasses, legumes, and forbs best suited to each kind of land.

The first important decision the operator must make is, "What forage plants do I want to manage for on each kind of land." The decision depends on what kinds of plants are growing on the land *now* as compared to what could be there, the seasonal grazing needs of his livestock enterprise, and the costs of practices that might be needed in relation to what they might accomplish.

Having decided what plants to manage for, the operator must choose the grazing systems and management practices that will increase them if they are present, or establish them if not.

Since grasses and other forage

plants manufacture food for growth in their leaves, grazing must be regulated to leave enough leaf material to enable the plant to function and grow properly. In other words, the needs of the plant must be considered as well as the needs of the animals.

The plants use the food manufactured in their leaves to produce more leaves, roots, and to make seeds. As the plant develops through the season, its needs change. Food stored in the roots is used to send up the first green shoots in the spring. These shoots soon grow enough to produce their own food and a surplus to serve other parts of the plant. Seedheads develop, seeds mature, and surplus food is stored again in the roots for next season.

The key plants

The different kinds of plants that make up the forage resource on each of the five general types of grazing land—whether they are native plants that naturally dominate the site, or flourish in the shade of trees, or establish themselves where trees are removed, or plants that have to be planted and maintained by cultural means—these facts determine the kinds of grazing systems that will succeed in each case. The chosen system should enable the operator to give his grazing land occasional rest, permit careful harvest of forage to meet the needs of the plants, and provide for adequate forage at all seasons of the year.

When grazing management is carried out in this way, plants remain healthy and productive, the land is protected, and livestock production is efficient.

The Five General Types of Grazing Land

1. Range

Range is land on which the natural potential (climax) plant cover is composed principally of native grasses, forbs, and shrubs valuable for forage. Rangelands include the natural grasslands and savannahs, such as the prairies and plains, oak and juniper savannahs, and chaparral or brushlands.

Conservation treatment is achieved primarily by regulating the intensity of grazing (numbers of livestock) and season of use (time of year) to protect and favor the more desirable forage plants. In addition to proper grazing, such practices as brush control, range seeding, and grazing systems can speed up range improvement. Fences, stock watering facilities (wells, springs, ponds), and trails or walkways make livestock control possible and management easier.

Capability of rangeland is expressed in terms of range sites, or distinctive kinds of range with different potentials for producing native plants. The present condition of the vegetation on each site



Range in New Mexico being properly grazed by sheep has blue grama and galleta as the main grasses.

is then evaluated in relation to the potential for the site as a basis for deciding how best to manage grazing for conservation and efficient forage production.

2. Grazable Woodland

Grazable woodland includes forested land managed for timber production which also produces significant amounts of forage that can be moderately grazed without damaging other forest values.

Grazable woodlands consist mostly of areas of ponderosa pine and pinion-juniper in the West, and slash and longleaf pine in the South.

Forage production fluctuates with development of the stand of trees. Conservation management requires proper season of use in relation to forage and tree development, protection of young plantations from all grazing for 2 or 3 years, and grazed firebreaks.

Moderate grazing aids in keeping down fire hazard by eliminating some of the fuel and brings in some income while trees are maturing.

Since grazing is a secondary use of such areas, it must be very carefully controlled.

Grazable woodland in the South consists of bluestems and panicgrasses among saw-palmetto bushes.





Native pasture of little bluestem, switchgrass, and Indiangrass released by chemical control of brush.

3. Native Pasture

Native pasture includes land managed to produce stands of native or "escaped" introduced plants for forage where the natural cover was once forest. Such land includes cutover forest land, abandoned cropland, or former tame pasture which has reverted to native grasses.

Native pasture may be too steep, wet, or rocky for the usual treatments of permanent tame pasture, and the operator may not want to put it back in trees.

Careful livestock management is necessary on native pastures to maintain adequate cover for soil protection and water conservation.

Brush control on all areas and the application of fertilizer on some areas are needed in addition to careful grazing use.

4. Permanent Tame Pasture

Permanent tame pasture is land on which introduced forage plants are maintained through intensive cultural treatments such as fertilization, periodic reseeding, and proper grazing management to maintain vigorous and productive plants. In addition, weed control is often needed.

This kind of pasture is suited to many kinds of soils. It is one of the best uses for land unsuited

for cultivation due to steep slopes, poor drainage, or erosion hazards when in cultivated crops.

5. Rotation Pasture

Rotation pastures are cultivated land planted to grasses and legumes and grazed as a part of the normal cropping systems.

Such areas usually are used for grazing or hay for 3 or 4 years then planted to a cultivated crop. Fertilization and proper grazing management are needed to maintain a productive stand of forage plants.

The use of grasses and legumes in a cropping system under good grazing management is an excellent way to improve soil conditions on cropland. ♦

Permanent tame pasture in West Virginia consists of orchard-grass and ladino clover.



Rotation pasture of tall fescue and ladino clover in sequence with row crops and small grain.





Proceedings of the Federal Inter-Agency Sedimentation Conference 1963. PREPARED BY AGRICULTURAL RESEARCH SERVICE. 1965. *USDA Misc. Pub.* 970. 933 pp., illus. \$5.75.

This publication contains 91 technical papers plus opening speeches, discussions, and the list of attendance from the Second Federal Inter-Agency Sedimentation Conference, held in Jackson, Miss., January 28 to February 1, 1963. The conference was sponsored by the 13 Federal agencies represented on the Subcommittee on Sedimentation of the Inter-Agency Committee on Water Resources.

Four symposiums were held consecutively on these subjects: (1) Land Erosion and Control, 26 papers; (2) Sediment in Streams, 36 papers; (3) Sedimentation in Estuaries, Harbors, and Coastal Areas, 15 papers; and (4) Sedimentation in Reservoirs, 14 papers. Two of the opening addresses and 6 of the technical papers were prepared and presented by people from the Soil Conservation Service. Carl Brown (deceased) reflected on the First Sedimentation Conference held 15 years earlier in Denver. L. C. Gottschalk (deceased) gave the keynote address and set the tone of the meeting.

Included in the symposiums were the following technical papers from the Soil Conservation Service: "Erosion and Its Control on Agricultural Lands," by John W. Roehl; "Geology in Sediment Delivery Ratios," by Sam B. Maner; "Gully Control Methods in Iowa," by Paul Jacobson; "Some Aspects of Fluvial Morphology Influencing Investigations of Channel Stability," by Elliott M. Flaxman; "Design of Stable Channels in Erodible Materials," by Paul D.

Doubt; and "Developing Sediment Storage Requirements for Upstream Retarding Structures," by A. F. Geiger.

This volume presents a wealth of information in the form of tables, graphs, sketches, and photographs, as well as text. It is a valuable reference for all who are concerned with sediment and the processes that create and affect sediment. The sum of knowledge presented is indicative of the current state of progress in this field and of the current thinking of geologists and engineers who are sedimentation specialists both in government and in universities.—JOHN N. HOLEMAN, *Geologist, SCS, Hyattsville, Md.*

Outdoor Recreation in the National Forests. BY U. S. FOREST SERVICE. 1965. *USDA, Agr. Inf. Bul.* 301. 106 pp., illus.

National forests constitute a major element of our total resources for outdoor recreation. For several types of recreation activities, they provide the major public land opportunities now and a tremendous potential for the future. This summation of the background, resources, recreation developments, activities, policies, and future prospects of our national forests in the outdoor recreation field is timely and welcome.

It is crammed with facts and statistics and is well illustrated. However, it is mainly useful to the professional conservationist or recreation specialist and to laymen deeply concerned with outdoor recreation.

It will be a valuable source book on the operation of Federal lands. Of particular significance is the section on policies with regard to such questions as multiple use, development and operation of facilities through private enterprise, restriction of the kinds of public developments in keeping with the nature of a forest, and avoiding competition with the private sector in handling wilderness areas.

Any public land agency, Federal or State, would find valuable guidance in the broad experience of the Forest Service in this field.—FRANK C. EDMINSTER, *Resource Development Division, SCS, Washington, D. C.*

New Publications

Losses in Agriculture. 1965. *USDA Agr. Hdbk.* 291. 120 pp., illus. Brings up to date information on the losses incurred in the production, processing, transportation, and marketing of farm and forest products.

Indian Land Areas. 1965. U. S. Dept. Interior, Bureau of Indian Affairs. 36x26 inch, folded to 4x8¾. Map showing Indian lands and listing field office addresses of the Bureau, including principal tribes within jurisdiction of each.

American Indian Calendar. 1965. U. S. Dept. Interior, Bureau of Indian Affairs. 52 pp., illus. An 8½ x 3¾" brochure listing ceremonials, dances, feasts, and other celebrations on or near Indian reservations of interest to tourists.

Vacationing with Indians. BY THE BUREAU OF INDIAN AFFAIRS. 1965. U. S. Dept. Interior. 72 pp., illus. A pocket guide to campgrounds and tourist attractions on Indian reservations.

Answers to Questions About American Indians. 1965. U. S. Dept. Interior, Bureau of Indian Affairs. 36 pp.

Soil Surveys

Allen County, Ohio. BY R. L. HEFFNER, A. R. BROCK, R. L. CHRISTMAN, AND D. D. WATERS. 1965. 99 pp., illus.; maps 4 inches to the mile (1:15,840). Surveyed by Department of Natural Resources, Division of Lands and Soil, State of Ohio.

Gem County Area, Idaho. BY F. R. TROEH, J. C. CHUGG, G. H. LOGAN, C. W. CASE, AND VIRGIL COULSON. 1965. 196 pp., illus.; maps 4 inches to the mile (1:15,840).

Gordon County, Georgia. BY GLENN L. BRAMLETT. 1965. 171 pp., illus.; maps 4 inches to the mile (1:15,840). Soils surveyed by Glenn L. Bramlett and Howard T. Stoner.

Calhoun County, Mississippi. BY J. W. McMULLEN, J. S. HUDDLESTON, CHARLES BOWEN, AND R. E. DAVIS. 1965. 65 pp., illus.; maps 4 inches to the mile (1:15,840).

Seward County, Kansas. BY HAROLD P. DICKEY, W. R. SWAFFORD, AND Q. L. MARKLEY. 1965. 51 pp., illus.; maps 3.17 inches to the mile (1:20,000).

A Better Place To Live

Summary of Activities of the Soil Conservation Service 1965

THE ESTHETIC, recreational, and other multiple-use aspects of conservation claimed increasing attention of the Soil Conservation Service during fiscal year 1965 as the Federal Government advanced its programs to adjust agricultural production and make the countryside a more pleasant place to live.

Rural beauty

The panel on "The Farm Landscape" of the White House Conference on Natural Beauty in May reported to the President:

"Less than 3 percent of our land is devoted to urban uses. Because of this fact, efforts to preserve and improve natural beauty and to create a more attractive America must rely heavily on what is done in rural areas. Some three-fourths of the land in these areas is in private hands. It therefore follows that for the greater part of America decisions about planning use and management of the resources which constitute the landscape rest in the hands of private individuals and their local organizations."

In response to a recommendation by the Farm Landscape panel "that preservation and enhancement of natural beauty be made an associated purpose of Federal programs of resources development and management," the Soil Conservation Service instructed its fieldmen giving assistance to land users and public planning agencies to give full consideration to "ways in which land use and soil and water conservation measures can improve the beauty of the

countryside, especially areas visible from roads and highways."

The directive called for special emphasis on conservation practices having natural beauty and landscaping values, the use of plant materials that contribute to natural beauty, and the elimination of "eyesore" areas.

The influence of SCS conservation planning assistance has far-reaching effect on the actions of private landowners and local organizations through soil conservation districts, small watershed projects, and consultation with public planning bodies.

In fiscal 1965, for the first time the number of cooperators with conservation districts exceeded 2 million and included more than half the farm operators in the United States. During the year, SCS provided more than 3.3 million separate services on conservation planning or application assistance to more than half the cooperators.

In addition, SCS provided over 94,000 consultative conservation services to county and municipal agencies, local organizations and business concerns, and private land owners and operators. It also was providing continuing technical services to 635 small watershed projects in operation and 342 others in the planning stage.

Even before this concerted emphasis on landscape beautification, soil conservation had contributed greatly to improving the appearance of the countryside by healing the unsightly scars of erosion, re-vegetating denuded forest and

range land, planting windbreaks and wildlife habitat areas, shaping and grassing roadside banks and waterways, creating ponds and lakes, and fitting roads, field boundaries, and crop rows to the curving contours of the land.

A majority of the more than 125 conservation practices reported by soil conservation districts (see table) make direct contributions to landscape beauty wherever used. The others indirectly enhance natural beauty by contributing to stable and harmonious land use and vegetation patterns.

Rural recreation

Rural landowners continued to establish primary or supplementary income-producing recreation enterprises and to develop outdoor recreation resources on their property in response to encouragement and assistance from the Department of Agriculture.

By the end of fiscal 1965, approximately 31,521 conservation district cooperators had established 1 or more recreation enterprises with SCS technical assistance since the Food and Agriculture Act of 1962 became effective. A total of 2,743 operators had converted to recreation as their major source of income on 631,742 acres.

Approximately 284,200 acres of farmland was converted from traditional agricultural use to recreation in fiscal 1965.

An inventory of outdoor recreation areas and enterprises, both private and public, was begun in cooperation with soil conservation districts and other agencies. The

inventory will provide for the first time basic data on outdoor recreation comparable to information normally available for other agricultural enterprises.

Community development

During the year, SCS participated in program and plan development for the Appalachian and Northern Great Lakes regions as well as for many smaller areas and communities. The Service provided information and assistance to conservation districts, planning boards, and other governmental units on problems of soil and water conservation and development, erosion and sediment reduction, flood prevention, outdoor recreation, and the limitations and suitabilities of soils for a wide variety of uses. SCS provided basic data for use in 355 comprehensive plans encompassing 3,367,607 acres. As a result, 749 properties totaling 23,377 acres were reported as properly treated.

Resource Conservation and Development Projects.—During the fiscal year, the sponsors of 10 pilot Resource Conservation and Development projects completed and submitted their project plans, and the Secretary of Agriculture authorized USDA assistance for operations. These projects include more than 17½ million acres in 34 counties in 11 States.

By June 30 about 300 separate "project measures," intended to provide new economic opportunities through accelerated conservation, development, and use of natural resources, had been completed or were underway.

Authorization has been requested for assisting 10 more project areas in planning and operations in fiscal 1966.

Appalachia.—The Soil Conservation Service began immediately to increase technical assistance for soil and water resource development in rural areas of Appalachia in response to the Appalachian Regional Development Act.

Summary of Progress, Fiscal Year 1965

Soil and Water Conservation in the United States

Progress items	Accomplished in fiscal year 1965—			Cumulative to June 30, 1965
	By use of funds under all SCS programs	By State employees & other agencies	Total reportable progress	
Individual Conservation Plans and Related Services				
District cooperatorsNo.	113,104	44	113,148	2,041,182
District cooperatorsacres	39,214,421	5,919	39,220,340	664,563,511
Cooperators canceledNo.	65,705	10	65,715	—
Cooperators canceledacres	20,041,677	652	20,042,329	—
Landowners assistedNo.	1,130,259	9,228	1,139,487	—
Services providedNo.	3,297,559	26,028	3,323,587	—
Owners applying practices . .No.	722,111	4,408	726,519	—
Basic plans prepared:				
FarmNo.	96,292	—	96,292	1,489,322
RanchNo.	4,401	—	4,401	59,108
OtherNo.	4,317	—	4,317	22,392
(Total basic plans)	(105,010)	—	(105,010)	(1,570,822)
Farmacres	20,355,573	—	20,355,573	307,870,391
Ranchacres	15,094,462	—	15,094,462	185,662,938
Otheracres	469,975	—	469,975	3,808,249
(Total basic plans, acres) . .	(35,920,010)	—	(35,920,010)	(497,341,578)
Basic plans canceled:				
FarmNo.	41,890	2	41,892	—
RanchNo.	1,571	—	1,571	—
OtherNo.	389	—	389	—
(Total plans canceled) . .	(43,850)	(2)	(43,852)	—
Farmacres	8,115,702	203	8,115,905	—
Ranchacres	5,182,850	—	5,182,850	—
Otheracres	14,568	—	14,568	—
(Total plans canceled, acres)	(13,313,120)	(203)	(13,313,323)	—
Basic plans revised:				
FarmNo.	36,626	2	36,628	—
RanchNo.	2,490	—	2,490	—
OtherNo.	200	—	200	—
(Total plans revised)	(39,316)	(2)	(39,318)	—
Farmacres	11,033,547	455	11,034,002	—
Ranchacres	10,515,936	—	10,515,936	—
Otheracres	94,040	—	94,040	—
(Total plans revised, acres)	(21,643,523)	(455)	(21,643,978)	—
Consultive Services				
Services providedNo.	93,725	297	94,022	—
RecipientsNo.	42,954	89	43,043	—
Basic data for use in comprehensive plansNo.	355	—	355	—
Basic data for use in comprehensive plansacres	3,367,607	—	3,367,607	—
Properties adequately treatedNo.	749	—	749	—
Properties adequately treatedacres	23,377	—	23,377	—
Operating Units				
Total operating unitsNo.	4,968	—	4,968	4,737,908
Total operating unitsacres	4,473,816	—	4,473,816	1,351,291,228
Other unitsNo.	672	—	672	1,198,233
Group Conservation Plans and Services				
Group investigationsNo.	4,016	—	4,016	33,405
Group investigationsacres	1,866,513	—	1,866,513	28,343,739
Group plans preparedNo.	2,965	—	2,965	33,371
Group plans preparedacres	1,403,000	—	1,403,000	24,559,408
Landowners or users in groupsNo.	16,309	—	16,309	236,900
Services provided on jobs . .No.	48,203	192	48,395	—

Summary of Progress, Fiscal Year 1965—Continued

Progress items	Accomplished in fiscal year 1965—			Cumulative to June 30, 1965
	By use of funds under all SCS programs	By State em- ployees & other agencies	Total reportable progress	
Great Plains Conservation Program				
Applications received.....No.	3,925	—	3,925	24,268
Applications received.....acres	6,826,437	—	6,826,437	49,573,549
Contracts signed.....No.	3,739	—	3,739	19,956
Contracts signed.....acres	5,290,996	—	5,290,996	39,227,743
Contract modifications.....No.	14,603	—	14,603	65,487
Contracts terminated:				
By mutual consent.....No.	95	—	95	370
By mutual consent...acres	68,921	—	68,921	720,975
For cause.....No.	103	—	103	394
For cause.....acres	90,785	—	90,785	352,491
By expiration.....No.	1,309	—	1,309	4,060
By expiration.....acres	2,011,778	—	2,011,778	6,353,269
(Total terminations, No.)	(1,507)	—	(1,507)	(4,824)
(Total terminations, acres)	(2,171,484)	—	(2,171,484)	(7,426,735)
Cropland before GP contract, acres	1,017,393	—	1,017,393	5,880,234
Planned cropland conversion, acres	187,248	—	187,248	1,299,568
Agricultural Conservation Program				
Referrals received F.Y. 1965.No.	354,563	137	354,700	—
" " P.Y. 1964..No.	—	—	—	359,546
Referrals serviced F.Y. 1965.No.	334,893	142	335,035	—
" " P.Y. 1964..No.	—	—	—	349,019
Cropland Conversion Program				
CCP referrals received....No.	847	—	847	—
CUP referrals serviced.....No.	367	—	367	—
Soil Surveys				
Standard soil surveys:				
High intensity.....acres	2,604,720	152,060	2,756,780	26,405,906
Medium intensity.....acres	41,412,263	1,890,616	43,302,879	480,036,101
Low intensity.....acres	8,725,751	148,343	8,874,094	70,608,797
(Total)	(52,742,734)	(2,191,019)	(54,933,753)	(577,050,804)
Reconnaissance	976,935	—	976,935	7,821,410
Soil conservation surveys.acres	2,234,807	88,174	2,322,981	285,067,603
Soil conservation surveys canceled or converted..acres	14,668,686	65,104	14,733,790	—
Supplemental soil surveys.acres	1,391,316	28,405	1,419,721	—
Snow Surveys and Water Supply Forecasting				
Snow course measurements.No.	3,710	896	4,606	—
Aerial snow marker readings	555	146	701	—
Mountain precipitation gage readings	1,098	147	1,245	—
Soil moisture readings....No.	1,173	252	1,425	—
River stations for which numerical forecasts issued.....No.	437	—	437	—
Numerical forecasts issued.No.	2,313	—	2,313	—
Income-Producing Recreation Enterprises				
Landowners with one or more income-producing recreation enterprises	5,034	1	5,035	31,521
Landowners with recreation enterprises as primary income source.....No.	610	—	610	2,743
Landowners with recreation enterprises as primary income source.....acres	140,476	—	140,476	631,742
Public Recreation Developments				
Recreation or fish and wildlife developments established as part of watershed projects	1	—	1	12

Twelve new watersheds were authorized for planning and 7 others approved for installation of land treatment and structural measures in the Appalachian region. There are now 38 projects in some stage of planning and 64 in operation. Total Federal cost of these 64 projects is estimated to be \$69 million.

Eleven sponsoring local organizations signed their first project agreements in 1965, signaling the start of actual construction in their projects. About \$5.9 million was obligated in small watershed projects in Appalachia during the year.

SCS also began arrangements to locate a new plant materials center to give special attention to revegetation problems in Appalachia. At the center and on nearby farms, SCS specialists will evaluate a wide variety of plants for use on the steep, shallow, acid soils of the region and to restore land left bare by mining operations to productive use for pasture, woodland, wildlife, or recreation.

Soil conservation districts

Since 1962 about two-thirds of the soil and water conservation districts have revised and updated their long-range programs to meet the expanding needs for resource conservation and development.

By the end of the fiscal year, 1,996 districts had signed new working agreements with the Department of Agriculture extending their goals to include conserving and improving not only soil and water but also "vegetative, wildlife, and related resources, and reducing damage by floods and sedimentation."

Thirty-six new conservation districts including 21,931,801 acres were organized by local people during the year. Consolidations and other changes eliminated 18 districts, resulting in a net increase of 18 districts and 14,073,002 acres over figures of a year ago. At the end of the year, SCS was assisting 2,989 districts totaling 1,753,281,-

000 acres. The districts contain 98 percent of the farms and ranches and 95 percent of the land in farms in the United States, Puerto Rico, and the Virgin Islands.

Conservation planning.—Soil conservation districts added 113,148 new cooperators operating 39,220,340 acres during fiscal 1965, bringing the total number of co-operators to 2,041,182, equivalent to about 55 percent of all the farms in districts. The cooperative agree-ments cover 664,563,511 acres, or 38 percent of the area in districts.

SCS helped cooperators prepare 105,010 basic conservation plans for 35,920,010 acres. A total of 497,341,578 acres, or 75 percent of the land under agreement, is covered by basic plans.

Land treatment.—For the first time this year, onsite information was collected on the acreage of land "adequately treated;" i.e., to which all items of the needed combinations of practices had been applied according to the standards and specifications of local technical guides.

The planned treatment was com-pleted on 22,692,192 acres during the year, equivalent to 63 percent of the acreage for which basic plans were prepared.

A total of 209,309,189 acres was reported as adequately treated as of June 30, about 42 percent of the total acreage covered by basic conservation plans.

The table contains data on the amounts of each of 128 separate practices applied during fiscal year 1965 and "on the land" at the end of the year.

Watershed protection

To reduce costs and increase efficiency, the Soil Conservation Service combined its watershed planning and river basin planning functions under the leadership of an assistant deputy administrator and placed watershed operations under another assistant deputy administrator.

During the past year the SCS

Summary of Progress, Fiscal Year 1965—Continued

Practices	Accomplished in fiscal year 1965—			On the land June 30, 1965
	By use of funds under all SCS programs	By State em- ployees & other agencies	Total reportable progress	
Conservation Practices Applied				
Beddingacres	20,871	639	21,510	398,969
Brush and weed control.....acres	5,856,194	15,185	5,871,379	32,742,596
Irrigation canal or lateralmiles	347	—	347	37,179
Cattle walkway.....miles	6	—	6	253
Chiseling and subsoiling.....acres	563,086	537	563,623	3,356,848
Clearing and snagging...miles	210	—	210	1,863
Conservation cropping systemacres	21,803,147	41,430	21,844,577	147,504,415
Contour farming.....acres	4,510,397	14,933	4,525,330	41,717,487
Contour furrowing.....acres	68,772	—	68,772	662,704
Contouring orchard, etc.....acres	8,666	70	8,736	184,290
Controlled burning.....acres	382,550	—	382,550	2,888,064
Cover and green manure cropacres	3,892,773	13,555	3,906,328	25,436,975
Critical area planting...acres	90,465	15,869	106,334	1,302,236
Crop residue use.....acres	16,475,141	40,373	16,515,514	106,550,740
Cutback border.....feet	699,897	800	700,697	7,127,654
Dam, diversion.....No.	986	—	986	18,646
Dam, multiple-purpose....No.	258	1	259	3,891
Debris basin.....No.	2,934	7	2,941	79,959
Range deferred grazing ..acres	14,908,410	810	14,909,220	48,185,135
Desilting area.....acres	1,434	—	1,434	2,640
Dikes and levees.....miles	245	—	245	8,220
Irrigation ditch and canal liningmiles	1,552	—	1,552	18,736
Ditchbank seeding.....miles	1,596	29	1,625	17,130
Diversionsmiles	2,909	19	2,928	88,361
Dune stabilization.....acres	6,108	—	6,108	81,090
Emergency tillage.....acres	483,472	—	483,472	4,355,948
Farm pond.....No.	55,907	197	56,104	1,420,733
Farmstead and feedlot windbreakacres	42,205	263	42,468	637,243
Field border planting...miles	1,274	5	1,279	38,309
Irrigation field ditch....miles	3,257	2	3,259	116,581
Field windbreak.....miles	4,049	68	4,117	75,839
Firebreakmiles	11,131	9	11,140	128,093
Fish and crop rotation...acres	5,205	—	5,205	19,009
Fishpond stocking.....No.	43,263	109	43,372	723,608
Fishpond management....No.	20,217	51	20,268	113,513
Floodwater diversion.....feet	16,664	—	16,664	1,046,154
Floodwater-retarding structureNo.	661	—	661	7,423
Floodwaymiles	28	—	28	296
Grade stabilization structureNo.	7,231	61	7,292	136,852
Grasses and legumes in rotationacres	1,563,862	4,604	1,568,466	17,821,663
Grassed waterway or outletacres	77,049	420	77,469	1,706,889
Hedgerow planting.....miles	359	11	370	30,525
Hillside ditch.....miles	362	117	479	7,586
Irrigation pipeline.....miles	4,101	1	4,102	42,607
Irrigation storage reservoirNo.	1,502	10	1,512	36,115
Irrigation system, sprinklerNo.	4,109	1	4,110	86,206
Irrigation system, surface and subsurfaceNo.	5,123	1	5,124	96,585
Irrigation system, tailwater recoveryNo.	484	—	484	6,340
Irrigation water manage- mentacres	2,656,552	2,685	2,659,237	10,900,269
Land clearing.....acres	705,313	1,234	706,547	10,707,083
Drainage land grading...acres	28,581	735	29,316	163,154
Irrigation land leveling...acres	457,316	602	457,918	8,154,537
Land smoothing.....acres	367,710	851	368,561	4,458,609
Livestock exclusion.....acres	885,110	1,721	886,831	17,633,030
Minimum tillage.....acres	1,074,137	217	1,074,354	6,619,449
Drainage main or lateral.miles	8,164	163	8,327	279,256

Summary of Progress, Fiscal Year 1965—Continued

Practices	Accomplished in fiscal year 1965—			On the land June 30, 1965
	By use of funds under all SCS programs	By State em- ployees & other agencies	Total reportable progress	
Conservation Practices Applied—Continued				
Mole drain.....miles	14,350	—	14,350	16,162
Mulchingacres	32,478	—	32,478	362,534
Mulch planting.....acres	41,602	1	41,603	167,203
Woodland natural seeding.....acres	62,606	384	62,990	2,700,793
Obstruction removal.....acres	35,988	110	36,098	623,737
Pasture and hayland renovationacres	1,574,953	7,439	1,582,392	17,399,592
Pasture and hayland plantingacres	2,299,339	8,180	2,307,519	44,382,787
Pipeline for livestock watermiles	1,643	9	1,652	14,190
Pittingacres	17,702	—	17,702	152,895
Plow planting.....acres	112,543	149	112,692	1,421,950
Pond sealing or lining....No.	607	—	607	7,927
Pasture proper use.....acres	7,690,290	35,812	7,726,102	27,545,044
Range proper use.....acres	64,635,143	8,644	64,643,787	179,723,521
Woodland proper grazing.....acres	1,419,444	—	1,419,444	8,873,124
Pumped well drain.....No.	4	—	4	112
Pumping plant for water controlNo.	2,250	—	2,250	40,233
Range renovation.....acres	9,604	—	9,604	1,528,413
Range seeding on converted landacres	145,701	1,087	146,788	4,321,364
Range seeding.....acres	365,146	268	365,414	7,536,474
(Total range seeding acres)	(510,847)	(1,355)	(512,202)	(11,857,838)
Irrigation pit or regulating reservoirNo.	2,546	3	2,549	38,860
Regulating water in drainage systemsacres	76,910	—	76,910	953,485
Rock barrier.....miles	3	—	3	51
Range rotation—deferred grazingacres	2,434,035	284	2,434,319	9,120,387
Row arrangement.....acres	406,778	52	406,830	2,017,480
Rotation grazing.....acres	3,601,922	32,297	3,634,219	12,284,407
Recreation access road...miles	461	3	464	3,459
Recreation area stabilizationacres	1,969	—	1,969	16,548
Recreation area planting.....acres	10,546	8	10,554	68,783
Recreation area pruning and thinningacres	3,591	69	3,660	27,900
Recreation land grading and shapingacres	5,473	—	5,473	63,072
Recreation trail and walk- waymiles	202	—	202	1,264
Spoilbank spreading.....miles	6,255	34	6,289	116,862
Spring development.....No.	4,827	14	4,841	82,009
Stock trail.....miles	183	—	183	3,296
Streambank protection...miles	326	1	327	4,380
Stream channel improvementmiles	1,158	—	1,158	9,156
Stream channel stabilizationfeet	56,685	—	56,685	2,570,970
Striperopping contour....acres	206,462	4,336	210,798	5,270,989
Striperopping, field.....acres	68,097	79	68,176	2,005,285
Striperopping, wind.....acres	432,997	—	432,997	12,804,524
(Total striperopping, acres)	(707,556)	(4,415)	(711,971)	(20,080,798)
Structure for water control.No.	89,298	110	89,408	1,395,451
Stubble mulching.....acres	3,396,194	—	3,396,194	17,976,013
Drainage field ditch.....miles	6,210	57	6,267	150,348
Terrace, basin.....miles	110	1	111	2,306
Terrace, gradient.....miles	16,331	134	16,465	836,329
Terrace, level.....miles	12,395	17	12,412	352,250
Terrace, parallel.....miles	4,918	16	4,934	34,673
(Total terraces, miles)....	(33,754)	(168)	(33,922)	(1,225,558)
Tile drain.....miles	22,150	327	22,477	621,639
Tile system structure.....No.	9,202	76	9,278	146,287
Toxic salt reduction.....acres	69,267	3	69,270	1,054,886
Tree planting.....acres	295,650	14,667	310,317	11,837,976
Trough or tank.....No.	12,271	111	12,382	288,129
Vegetative barrier.....miles	301	231	532	6,000

provided additional Departmental leadership in several interagency assignments including (1) the Potomac River Basin Study Group, (2) the North Atlantic Regional Drought Study, and (3) the Water Resources Council.

Planning.—Applications for Soil Conservation Service assistance in watershed planning under Public Law 566 were received for 180 watersheds in fiscal 1965, bringing the total to 2,317 requests from 49 States and Puerto Rico.

New authorizations for planning of 109 watersheds brought the total to 1,111, or 48 percent of the applications received to date. Although States and local authorities contributed more than \$3 million to accelerate planning work, the backlog of unserved applications increased by 71 during the year.

A record number of 96 plans were completed during fiscal 1965, and 66 were approved for operations. Major changes were approved in the plans for 32 projects.

Operations.—At the close of the year Federal assistance was being provided to 635 approved projects to plan and install land treatment measures and make the engineering surveys and designs required in advance of construction.

Initial agreements for construction were signed in 59 projects located in 31 States, bringing the total to 455 projects that have entered the construction stage. Of this number, 424 or 93 percent have signed contracts for the installation of structural measures.

All land treatment and structural measures have been completed in 78 projects located in 30 States. A total of 41 States now have 1 or more projects with all structural measures installed.

Multipurpose projects.—More than 47 percent of small watershed projects approved for operations now have multiple-purpose objectives. Sixty-five percent of those approved in 1965 are multipurpose projects and 19 previously approved plans were amended to

make them multipurpose. Principal additions were recreation and municipal water supply.

Plans for 19 recreation developments were approved for operations in fiscal 1965, an increase of 53 percent over the previous year. There also were 46 new preliminary approvals for recreation projects. Other purposes in addition to flood prevention increased as follows: Municipal water supply, 20 percent; water management, 19 percent; and fish and wildlife, 8 percent.

Other projects.—Work plans were prepared for 10 subwatersheds covering about 489,000 acres in the 11 major river watersheds authorized for flood prevention work. To date, 244 plans have been prepared for 19,454,000 acres, or about 63 percent of the total authorized area.

By June 30, 1965, all works of improvement had been installed on 50 of the pilot projects authorized in 1953. Four more are scheduled for completion in 1966.

River basin surveys

The Soil Conservation Service participated in 31 interagency river basin surveys during fiscal 1965 under the provisions of Public Law 566.

The Service has developed proposals for participation of the Department of Agriculture in the Water Resource Survey to be carried out under the provisions of the Appalachian Regional Development Act.

With assistance from other concerned agencies, SCS prepared comments under procedures of the Interagency Committee on Water Resources on 37 proposed projects of the Corps of Engineers, 10 proposed reports of the Bureau of Reclamation, and 3 other proposed reports.

Great Plains conservation

Interest of landowners in the Great Plains Conservation Pro-

Summary of Progress, Fiscal Year 1965—Continued

Practices	Accomplished in fiscal year 1965—			On the land June 30, 1965
	By use of funds under all SCS programs	By State em- ployees & other agencies	Total reportable progress	
Conservation Practices Applied—Continued				
Vertical drain.....No.	65	1	66	1,524
Waterspreading.....acres	34,387	4,850	39,237	853,583
Well.....No.	7,954	4	7,958	324,835
Wildlife habitat preservation.....acres	1,328,556	765	1,329,321	7,881,907
Wildlife wetland development.....acres	69,255	70	69,325	730,146
Wildlife habitat development.....acres	237,900	248	238,148	2,794,598
Wildlife wetland preservation.....acres	183,433	20	183,453	1,537,469
Wildlife watering facility..No.	310	—	310	5,249
Woodland direct seeding..acres	16,902	20	16,922	369,280
Woodland harvest cutting.acres	828,810	2,765	831,675	13,539,227
Woodland intermediate cutting.....acres	856,853	375	857,228	13,108,662
Woodland interplanting...acres	28,123	948	29,071	765,129
Woodland pruning.....acres	12,900	2,326	15,226	332,423
Woodland thinning.....acres	51,894	2,287	54,181	1,555,091
Woodland underplanting..acres	28,533	3,163	31,696	709,594
Woodland weeding.....acres	402,441	6,488	408,929	8,615,269
Land Treated				
Land adequately treated..acres	22,683,035	9,157	22,692,192	209,309,189
Land Use Conversions ¹				
Cropland to grassland....acres	1,885,896	2,005	1,887,901	10,108,893
Cropland to woodland....acres	123,321	319	123,640	1,169,392
Cropland to wildlife- recreation.....acres	71,138	5	71,143	507,708
Cropland to "other"....acres	90,858	12	90,870	2,037,673
All other uses to cropland.acres	386,668	36	386,704	2,741,894
All other uses (except cropland) to wildlife-recreation...acres	213,035	24	213,059	1,633,207

¹ Conversions on the land June 30, 1965, are estimates of conversions since July 1, 1962.

gram continued high in fiscal 1965. New contracts covering conservation and land use adjustment plans on 5,290,996 acres were signed by 3,739 cooperators. A backlog of 4,312 unserved applications was carried over awaiting new funds for the 1966 fiscal year.

By the end of the year, 19,956 cooperators with 39,227,743 acres had participated in the program in 395 designated counties.

New contracts in 1965 included plans to convert 187,248 acres of cropland to grass, one of the major objectives of the program. Planned conversions now total 1,299,568 acres, or 22 percent of the cropland on the farms and ranches before planning.

Establishment of permanent vegetative cover continued to be the leading practice established under cost-sharing arrangements. Partic-

ipants in 1965 established or re-established vegetation on 172,627 acres. Other practices in order of the amount of cost-shares paid were terrace construction, 5,673 miles; controlling competitive shrubs, 347,810 acres; dams, pits, or ponds, 2,123; wells for livestock water, 1,648; and reseeding rangeland, 99,127 acres.

Cropland conversion

Land use adjustments in accordance with conservation plans in soil conservation districts and watershed projects continued to move large acreages out of cultivation during 1965.

An estimated 2 million acres of cropland was converted to other uses, including 1,887,901 acres to grassland, 123,640 acres to woodland, 71,143 acres to wildlife and recreation, and 90,870 acres to

“other” uses. A small part of this was offset by conversion by farm operators of about $\frac{1}{3}$ million acres from other uses to cropland, resulting in a net reduction in cropland of $1\frac{2}{3}$ million acres.

A review of land use changes in small watershed projects showed that the net effect of land treatment is a reduction in cropland and increase in grassland.

In the first 540 watershed work plans approved, cropland was reduced 168,800 acres while pasture and range increased 753,300 acres.

An analysis of 10 years' land use adjustment in the Six Mile Creek Watershed Project in Arkansas showed that cropland was reduced from 30,061 acres before the project to 5,970 acres in 1963—an 80 percent reduction.

In eight representative projects in Texas covering 1.75 million acres, total cropland has been reduced from 556,000 to 480,000 acres, or 14 percent. Acreage in cotton was reduced 55 percent and in corn 75 percent.

Soil surveys

With a large backlog of field work completed, SCS in fiscal 1965 stepped up the preparation of soil surveys for publication. Thirty-nine surveys were published and 49 were in press at the end of the year, compared to 34 published in 1964.

New mapping during the year totaled 57,256,734 acres, bringing the total area covered by surveys suitable for use in farm and ranch planning to 862,118,407 acres. This amounts to about 38 percent of the total land area scheduled to be surveyed.

On January 1, 1965, the Soil Conservation Service began using a new system of soil classification that had been in the process of development for several years. New soil survey manuscripts identify the series by the new classification.

Soil investigations designed to answer specific questions in soil surveys and interpretation con-

tinued. During the year, characterization analyses were completed on 1,996 samples from 304 profiles in 27 States.

New methods were adopted for determining calcium, magnesium, aluminum, and carbonates; for extracting and determining free iron; and for preparing saturation extracts.

A program was developed for the automated processing of calculations of bulk density and moisture relations.

The cartographic plants produced 497,183 prints of 159,735 plain maps and 378,146 prints of 134,775 soil and capability maps for farm planning.

Conservation Needs Inventory

In March 1965, eight USDA agencies were directed to update the National Inventory of Soil and Water Conservation Needs. This inventory will provide data on physical conditions, present land use, conservation problems, and treatment needs of non-Federal rural land. Completion date is December 31, 1967. Procedures for updating the watershed projects inventory were issued in August 1964, calling for completion by December 31, 1967.

The cost of conservation

An analysis of costs and sources of funds for conservation treatments applied on private land (exclusive of watershed programs, resource developments, and land adjustment programs) in fiscal 1965 showed that landowners and local districts carried more than half the burden.

Of an estimated total of \$923.3 million, landowners and districts provided \$535.3 million or 58 percent, States and local agencies and organizations \$50.1 million or 5 percent, and Federal appropriations \$337.9 or 37 percent. Soil conservation operations (SCS) funds amounted to \$103.2 million or 11 percent of the total, and ACP cost-shares an estimated \$220

million or 24 percent.

For every dollar of Federal funds provided for the design, layout, and installation of planned practices in 1965, about \$12 of conservation treatments were applied by cooperating landowners, of which about one-third was financed by cost-share programs.

Advances in technology

Plant sciences.—Use of the universal soil loss equation, first developed in the Corn Belt, has been extended to other regions as the major technical basis for developing specifications for conservation cropping systems. Continuing research is needed to provide basic data for the several factors in the equation in different parts of the country.

During the year the Soil Conservation Service gave increased technical range planning assistance to the Farmers Home Administration and grazing associations in the West. The Service issued national standards for range conservation practices and for range proper use.

A system for classifying soils for woodland use on a nationwide basis has been developed. It will be subjected to field test in the next year. There is increasing interest in windbreak activities throughout the Great Plains and in several Western States.

SCS biologists responded to an increased number of requests for technical information on wildlife in connection with income-producing recreation enterprises. The preparation of information on the economic costs and returns of recreation is being encouraged.

Installations in California watershed projects to provide for passage of steelhead trout and salmon to their spawning grounds successfully passed the test of the 1964-65 winter spawning runs.

The Service's plant materials centers continue to develop and introduce new conservation plants. Seed increase on district cooperator's farms in the South is gain-

ing impetus with stocks originating at the Americus and Coffeeville centers.

Substantial improvements were made in facilities, equipment, and appearance at a number of centers. Two additional centers were authorized during the year, bringing the total to 20. One is being located in New Jersey to serve the Atlantic Coastal Plain and the other in the Appalachian region.

Engineering.—Considerable progress was made in the refinement of engineering design policy and the development of design procedures. Standard construction drawings for covered risers for drop inlet spillways were completed under a contract for engineering services.

The snow survey and water supply forecasting activity entered new phases of work in a continuing effort to provide better forecast information to the public. Agreements were signed for the development of electronic telemetry systems in two States and for installation of fully automatic data collection systems in three others.

The Service is cooperating with the Bureau of Reclamation in the Atmospheric Water Resources Program in Colorado and is expanding its snow survey network in Alaska in cooperation with the Corps of Engineers.

The volume of hydrologic work increased in river basin surveys, assistance in foreign aid programs, and the electronic processing of hydrologic problems of watersheds and river basins.

During the year, the Soil Mechanics Laboratory processed 8,629 samples from 872 sites.

Good progress was made in the development of systematic methods of planning parallel terrace systems compatible with the use of large farm equipment.

There has been a noticeable increase in cooperation and exchange of ideas and data with engineers and geologists from other Federal and State agencies in completing

geologic investigations for construction. Cooperative studies, with the U. S. Geological Survey, Agricultural Research Service, and others, concerning reservoir trap efficiency, sediment yield, gully erosion, and control measures are continuing.

A work project was set up to undertake the classification of earth dams commonly encountered in watershed and other SCS activities. The purpose of a classification system is to group dams into categories for which appropriate design and construction criteria may be assigned. This is aimed at reducing time spent by design engineers, providing a more uniform approach to design and construction problems, and general improvement in the quality of completed construction work.

Personnel

During the year the Service relocated technical personnel in the field giving support to State offices from 15 different headquarter locations to 4 Regional Technical Service Centers at Upper Darby, Pa.; Fort Worth, Tex.; Lincoln, Nebr.; and Portland, Oreg. These moves, involving 254 employees, resulted in savings in personnel, office space, travel, and other costs, and made possible better coordination of services from different subject matter specialists. Also, 7 area offices were discontinued.

In accordance with the Civil Rights Act of 1964, SCS has taken positive steps to assure that non-discrimination is practiced in providing services to land owners and operators and in hiring, training, and promoting SCS personnel. All SCS offices were desegregated before the end of the fiscal year. While total SCS employment increased 2.3 percent during fiscal 1965, employment of Negroes increased 152 percent.

SCS has found a scarcity of qualified Negro graduates available for recruitment in fields involved

in soil and water conservation. The Service has made tangible progress in assisting colleges and universities, including Negro institutions, in upgrading their agricultural and engineering curricula and standards.

Economic Opportunity Act

The Soil Conservation Service provided technical direction to Neighborhood Youth Corps projects in 23 States and work-study programs for students in 6 States under the Economic Opportunity Act.

The projects were planned, sponsored, and operated by State soil and water conservation commissions and local conservation districts. They gave more than 1,200 young people summer income and on-the-job training in conservation work in field and office. In all, more than 400 districts participated in the program.

Conservation in foreign lands

The Soil Conservation Service continued to operate conservation projects in Algeria and Tunisia under contracts with the Agency for International Development (AID). In 1965, SCS also provided two soil scientists as members of a team for the Frontier Development Program in Brazil, four specialists as trainers in soil and water conservation programs in Nigeria, and an agronomist as a trainer in Nicaragua.

In addition several technicians were on detail to Costa Rica, El Salvador, Morocco, and Thailand to assist and advise on special projects. The Administrator consulted with and advised the governments of Costa Rica and El Salvador on special erosion problems.

During 1965 SCS provided training to 151 individuals and 22 groups of foreign nationals from 53 countries. This training was provided from the Washington office, 12 units of the Regional Technical Service Centers, and in field locations in 35 States. ♦

From the Administrator:

Conserving Grazing Land A Landmark Passed



GRAZING LANDS today are important in every State. No longer is the conservation of grassland a concern primarily of range-men and ranchers of the West.

The extension into all parts of the country of livestock production based on growing and using grass is just one of the fundamental changes in American agriculture brought about by changing technology.

The Soil Conservation Service has had a major part in developing the grassland technology and encouraging the land use shifts that have made this result possible.

The Service is constantly adjusting its staffing to provide the technical guidance needed with the new land use patterns. We want to be prepared to aid land owners and users with the conservation and management of the several types of grazing land in each section of the country.

Livestock operators—whether they produce beef, wool, lamb, milk, mohair, riding horses, or outdoor recreation opportunities—depend on one or more kinds of grazing land. Stable and efficient livestock enterprises contribute to the well being of communities and of the Nation. Conservationists who assist livestock operators and other users of grazing land must have the most modern and best technical information available.

Proper grazing is important not only to soil and water conservation as a part of individual livestock enterprises; it is essential to effective watershed protection, to wildlife habitat improvement, and to recreation resource development. Many of our valuable grazing plants are also finding wide use in stabilizing critical erosion areas, in highway plantings, and for im-

proving the natural beauty of the countryside.

Rangemen, agronomists, plant materials specialists, and soil scientists, working together as a team, furnish the needed technical information and support to the conservationists who directly assist land owners and users. Each of these technical disciplines is involved in sound grazing land conservation.

It is important, therefore, that conservationists in every work area be familiar with the principles of grazing land conservation and management and know how to apply them to the types of grazing land found locally.

THE NATIONAL program of soil and water conservation on private land passed a significant landmark in 1965 when the number of district cooperators for the first time exceeded 2 million.

The annual summary of accomplishments shows that more than half—a majority—of the 3.7 million farms and ranches in districts (which include 98 percent of all those in the United States) now have orderly plans for using land within its capability and conserving basic soil and water resources. Nearly 1.5 million or three-fourths of them have plans sufficiently complete to be counted as “basic” conservation plans.

While the steady decline in number of farms and ranches has helped to close the gap between number of district cooperators and total operators, the shift to non-farm uses has created a new clientele for conservation services.

An increasing number of rural property owners are using their land for recreational or esthetic

purposes rather than for the production of crops, livestock, or other commodities. This requires a different kind of evaluation of land and water resources and different ways of manipulating them to get the desired benefits without permitting deterioration of their essential values.

More and more land on the edges of cities and in rural areas is being devoted to industrial and residential sites. These uses of land sometimes are more demanding on technical knowledge of soils and hydrology and the principles and techniques of safe land use than are the usual agricultural endeavors. They present a pyramiding need for perceptive conservation planning and sound technical advice in these areas.

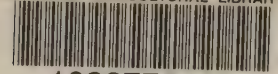
The 1965 report reflects our increasing activity in these new aspects of technical assistance on land and water problems. For example, the Soil Conservation Service last year provided more than 94,000 consultative services on such matters to private individuals, organizations, business concerns, and public agencies.

SCS fieldmen also helped many rural landowners establish outdoor recreation enterprises. They provided more and more assistance to official local planning bodies for communitywide resource development and land use planning.

Much of this kind of effort does not lend itself to numerical recording and does not show in statistical reports of progress. But SCS fieldmen throughout the country and the people they work with are aware of our increasing attention to an ever broadening range of conservation problems.

Although we may have passed the half-way mark in enlisting farmers and ranchers in the conservation effort, a still greater challenge lies ahead in the necessary job of providing adequate guidance in soil and water conservation to all land users.

D. A. WILLIAMS



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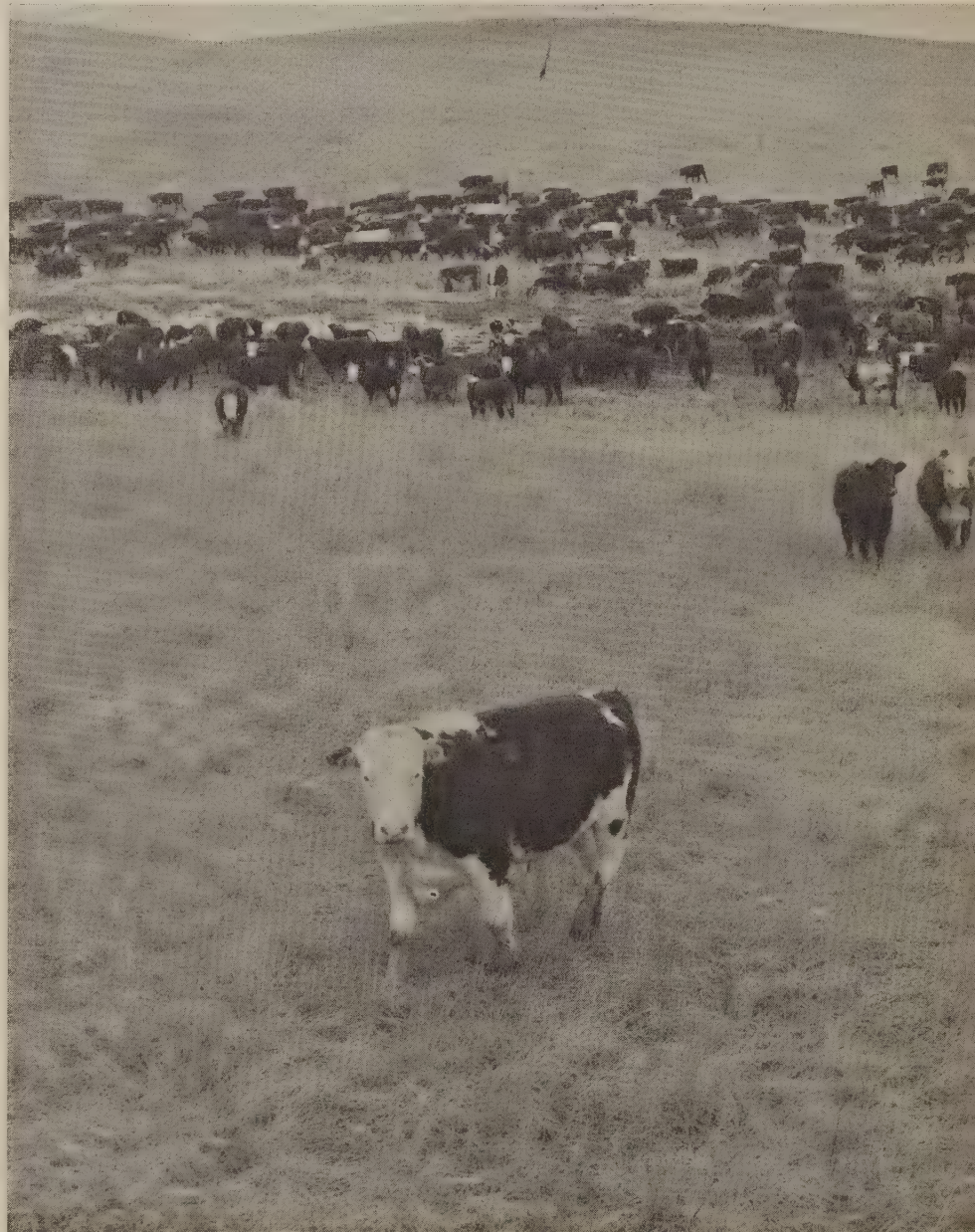
Steer Ranching And Deferment Improve Range

BY STICKING to steers and leaving more grass than they take, a South Dakota rancher has transformed low-producing, weed-infested rangeland into a show-place of native grass.

Tom Boylan of Leola became a cooperator of the McPherson County Soil and Water Conservation District in 1959. His conservation ranch plan called for proper range use, deferred grazing, water developments, and cross fencing.

Principal grasses on the Boylan ranch are big and little bluestem, green needlegrass, and western wheatgrass. Some pastures were rested from grazing for 2 years to permit better grasses to get ahead of the weeds. Now, between 500 and 700 acres of rangeland gets a complete deferment every year. Deferments are rotated so that all rangeland is rested once every 5 years.

Boylan runs between 1,000 and 1,400 yearling steers on his 6,400 acres. He likes steers because they provide more flexibility in numbers. His gains on steers, from grass alone, have averaged slightly over 2 pounds per head per day from April to October.—THOMAS H. POZARNISKY, *Range Conservationist, SCS, Mobridge, S. Dak.* ♦



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Soil Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

QUALITY OF ENVIRONMENT
A statement by the Secretary of Agriculture

Wildlife for Pleasure and Income

This month's special theme

Gehrt



SOIL CONSERVATION SERVICE

U. S. DEPARTMENT OF AGRICULTURE



Quality . . .

The Secretary of Agriculture's statement (p. 171) on quality in environment makes explicit a philosophy that has underlain soil conservation work from the beginning.

In earlier days, benefits were usually translated in terms of production and income, for those were the main concerns of people interested in the land.

In a more affluent era, urban people as well as farmers are awakening to other values of land and water resources.

The whole Nation increasingly looks to the countryside as a place to live and a source of physical and spiritual refreshment.

Consistent with the principle that *resources are for people*, the emphasis in conservation and land use shifts with the changing needs and concerns of our population.

Accordingly, quality of the human environment in rural America is the avowed goal of modern conservation.

Planning: Independent first-hand accounts in this issue by two conservationists who help landowners plan the use of their resources illustrate the new trend to enhance esthetic and recreational values.

Biologist David Allan (p. 183) tells how New Hampshire district cooperators cherished and improved marshland on their properties.

And Woodland Conservationist Ross Mellinger's picture story (p. 180) speaks eloquently of the appeals of woodland that often outweigh commercial values in planning decisions.

COVER: A guide accompanies a paying hunter along a field strip planted for pheasant cover on a shooting preserve in the Northern Virginia Soil Conservation District.

Soil Conservation

Devoted to the wise use of land and water resources

MARCH 1966

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The Quality of Our Environment

By Orville L. Freeman

and industrialization, the flow of pollutants to our air, soils, and waters is increasing. This increase is so rapid that our present efforts in managing pollution are barely enough to stay even, surely not enough to make the improvements that are needed."

The report set forth 13 "principles" and made nearly 100 specific recommendations of actions, studies, measurements, research and development activities, and manpower measures.

The President immediately directed the executive departments and agencies, including the Department of Agriculture, to consider the recommendations and report to him on ways they could help restore the quality of our environment.

As defined by the panel, the problem of environmental pollution—"the unfavorable alteration of our surroundings"—deeply involves the Department of Agriculture and all resource conservation agencies and organizations.

The Department concurs generally with the recommendations set forth. We have suggested specific ways in which we can increase our activities in this area, including some for which additional funds, manpower, and legislative authority would be necessary.

The review of our activities in relation to the panel's recommendations also highlights an impressive array of ongoing programs

that contribute to quality of environment.

The Department of Agriculture is long experienced in modifying environment. Through research and education we have shown farmers how to make a productive environment for plants and animals, giving the American people an unrivaled abundance of food and fiber.

It is time to turn our attention more to *environment for people*.

After all, what is of more concern to the Department of Agriculture than the condition of the lands and waters of rural America? Rural America is home of a fourth of our people and playground for the rest, site of our farms and ranches and a growing number of

DEFINITION

Environmental pollution is the unfavorable alteration of our surroundings, wholly or largely as a byproduct of man's action, through direct or indirect effects of changes in energy patterns, radiation levels, chemical and physical constitution and abundances of organisms. These changes may affect man directly, or through his supplies of water and of agricultural and other biological products, his physical objects or possessions, or his opportunities for recreation and appreciation of nature.—Report of the President's Science Advisory Committee on "Restoring the Quality of Our Environment."

LAST NOVEMBER the Environmental Pollution Panel of the President's Science Advisory Committee presented to the President a definitive report based on 15 months' study of the damaging effects of man's actions on his environment.

The report, *Restoring the Quality of Our Environment*, is a penetrating analysis and assessment of an interlinked tangle of problems that affect every citizen.

As the President stated on receiving the report:

"Ours is a Nation of affluence. But the technology that has permitted our affluence spews out vast quantities of wastes and spent products that pollute our air, poison our waters, and even impair our ability to feed ourselves. At the same time, we have crowded together into dense metropolitan areas where concentration of wastes intensifies the problem.

"Pollution now is one of the most pervasive problems of our society. With our numbers increasing, and with our increasing urbanization

industries, and the brightest hope for living space for the millions of additional people to be added to our population before the end of the century.

Already our great cities are showing signs of floundering under the weight of too many people in too little space and the congestion and contamination they produce. Increasing population only compounds the problems of environmental pollution—more smog in the air and more filth in the water, more tangled traffic clogging the streets, and more urban sprawl engulfing the open land nearby.

Some of the problems on which the Department of Agriculture is working to improve the quality of our environment are pesticides, soil pollution, sediment and dust, floods, and urban land use. These efforts can be expanded and accelerated in response to the recommendations of the President's Science Advisory Committee.

Of all the problems treated by the report, perhaps none has been

the subject of greater public concern than the use of pesticides.

In research, education, and regulation, the Department has taken positive steps to increase the efficiency and safety of pesticides. We have made considerable progress in advancing proposals of earlier reports on this subject, including a study by another panel of the President's Science Advisory Committee.

In recent years we have expanded our efforts to develop effective alternative pest control weapons and techniques. This effort is being continued.

Aside from public concern about the effects of the use of pesticides, the possibility of soil pollution from this and other chemical sources is a major concern of the Department.

We have research and monitoring programs to evaluate and establish existing levels of a variety of pollutants, although not on the scale needed. New legislation would be required to authorize the De-

partment to administer control and abatement programs.

Studies are being conducted, for example, to distinguish between lead naturally present in soil and that added from other sources, such as from the exhaust of automobiles using gasoline with lead additives.

The Soil Conservation Service and the Forest Service maintain a system of monitoring soils for radioactivity. Fieldmen in all parts of the country are prepared to detect radiological contamination of soils, water, and foodstuffs in emergencies.

Scientists and technicians of the Department also monitor soil and water at 55 locations throughout the Nation for residues traceable to the use of agricultural chemicals. Intensive studies at 5 locations deal with such vital questions as translocation to plants, movement in drainage water, and effects on non-target organisms.

There are other pollution problems, in addition to pesticides and other chemicals, that concern agri-

PRINCIPLES . . . From the Report on the Quality of Our Environment

1. *The public should come to recognize individual rights to quality of living, as expressed by the absence of pollution, as it has come to recognize rights to education, to economic advance, and to public recreation.*

2. *The responsibility of each pollutor for all forms of damage caused by his pollution should be effectively recognized and generally accepted. There should be no "right" to pollute.*

3. *The roles of all governmental authorities, local, State, and Federal, in pollution problems should be complementary and mutually supporting.*

4. *Federal agencies should give special attention, in all operations they conduct, support, or control, to avoiding and managing pollution, both to reduce it and as an example to others.*

5. *All agencies and organizations*

concerned with pollution should strengthen programs that lead to better public understanding of pollution and its problems.

6. *All concerned should recognize the quality of human life and the presence and growth of other living things as the major values currently damaged by pollution.*

7. *The special importance of the automobile as a source of pollution problems should be clearly recognized.*

8. *As our pollution problems became steadily more serious, it should be generally recognized that we must consider our balances and choices within successively larger and more complex systems.*

9. *Each department or agency having responsibility for both enforcement and research in pollution should provide administrative and budgetary separation sufficient to minimize interference between its*

research and development activities on the one hand, and its investigative and enforcement activities on the other.

10. *In making decisions about resource use and community development, including transportation systems, urban renewal, irrigation, drainage, and agricultural practices, information about effects and behavior of pollutants should be an essential consideration.*

11. *The filling-in of shallow waters essential in life cycles of fishes and shellfish be regarded as an important kind of pollution.*

12. *The control of pest populations should increasingly depend on an integrated combination of pesticide use with a wide variety of bioenvironmental techniques.*

13. *Unnecessary use of pesticides should be avoided whenever possible.*



culture.

Erosion of the land, both rural and urban, pours countless tons of sediment into lakes and streams, rendering water unhealthy and unusable for man, animals, and fish. Lately, a major source of sediment has been from the effects of construction in suburban housing and industrial areas and on highways.

Soil disturbed during construction also is carried aloft by winds. The dust further pollutes the air, adding to human discomfort. Dust from soil blowing in the Great Plains and other wind erosion areas is recognized as the cause of respiratory disorders and a hazard to automobile traffic as well as a general irritant and inconvenience.

The Department has long carried on major programs of erosion control and soil conservation. The technical assistance provided by the Soil Conservation Service to local conservation districts; cost sharing and credit made available to individual land owners and groups through the Agricultural Conservation Program and Farmers Home Administration; watershed projects and the Great Plains Conservation Program—these and many other activities of the Department are making substantial progress in correcting environmental pollution caused by erosion and uncontrolled runoff.

For example, it is estimated that the Department's program for erosion control in the Potomac River basin could reduce sediment in the stream by 50 percent. Acceleration of land treatment on the entire watershed is recommended by the Federal Interdepartmental Task Force on the Potomac as part of a comprehensive plan requested by the President to make the river that flows by the Nation's Capital "a model of scenic and recreation values for the entire country."

Problems of environmental pollution in rural America (top to bottom): Pesticides, pollution, sediment, dust, floods, and suburban sprawl.

Floodwater is another form of environmental pollution, at once the cause and the result of "unfavorable alteration of our surroundings."

As our farms, homes, industries, and towns increasingly modify the landscape and interfere with natural drainage patterns, the frequency and volume of floods also increase. The hazards to life and health, damage to property, and interruptions of daily living resulting from floods continue to pyramid wherever we place our homes and buildings in the way of uncontrolled streams.

The extensive flood prevention and watershed protection programs of the Department of Agriculture are aimed at avoiding and correcting such damages in all the Nation's watersheds.

The small watershed projects under the Watershed Protection and Flood Prevention Act give local communities the means of establishing orderly control and development of water resources on local watersheds.

The Department also participates with other Federal and State agencies in river basin surveys and planning designed to bring widespread solutions of flood and water use problems.

These action programs are supported by research involving such studies as (1) establishing relationships between sediment yields and erosional processes, (2) understanding and controlling the deposition of sediment in reservoirs, (3) minimizing or correcting gully-ing, channel cutting, or streambank erosion on watersheds, and (4) determining the extent to which sediment in streamflow may serve as the carrier of undesirable wastes or residues.

The report of the President's Science Advisory Committee underscores the importance of these activities to a quality environment.

The growth of urban areas is creating a whole new complex of unsatisfactory living conditions be-

cause of unintentioned misuse of the land or disregard for soil suitabilities and limitations.

Besides the erosion and sedimentation that result from extensive scalping of topsoil during construction, flooding problems often result from interrupting natural drainageways or building on waterlogged soils. Individual sewage disposal systems fail to function when located on unsuitable soils. Many other unforeseen difficulties plague the householder or developer who proceeds without adequate knowledge of soil and site conditions.

The Department, through the soil surveys and technical services of the Soil Conservation Service, increasingly is helping suburban land use planning agencies and individual builders in urban fringe areas cope with these problems.

We in the Department endorse the spirit and intent of the report on *Restoring the Quality of Our Environment*. This is an historic goal of the Department.

The report strengthens our will to extend the concept of conservation and resource development beyond the aims of satisfying material wants. Through emphasis on enhancement of natural beauty, improvement of recreation re-

sources, preservation of wildlife and natural areas, and related goals in land use planning and conservation, our efforts underscore the objective of the Environmental Pollution Panel of the President's Science Advisory Committee.

The Department of Agriculture has a unique responsibility in the effort to safeguard our environment, because it is the principal Government agency authorized to carry on conservation programs affecting the renewable resources on privately owned land—and that is where most of our people live.

Through its working relationships with the nearly 3,000 soil conservation districts that blanket the country, and a growing number of small watershed projects, the Department gives counsel and assistance to land owners and operators. It is they who will finally decide, through their individual actions, the character and quality of our daily surroundings.

Through the Soil Conservation Service, the Department provides private groups and public officials with detailed soil surveys and information as a basis for communitywide land use planning and the conservation treatment of individ-

ual properties.

It provides technical assistance in planning small watershed and resource conservation and development projects and can share the cost and provide credit to help finance the needed installations and treatments.

By sharing with landowners the cost of soil and water conservation practices of benefit to the general public, the Agricultural Conservation Program of ASCS encourages improvements in the rural landscape that might not otherwise be made. These measures include practices specifically designed to benefit wildlife and increase outdoor recreation resources. The Farmers Home Administration provides credit for soil and water conservation work and recreation developments.

Through its other cost-sharing, credit, and educational programs the Department helps individual land owners and groups conserve and restore essential resources, all contributing to the quality of the environment where people live.

The New Conservation, as the President so eloquently defined it in his Message on Natural Beauty, is "a creative conservation of restoration and innovation. Its concern is not with nature alone, but with the total relation between man and the world around him. Its object is not just man's welfare but the dignity of man's spirit."

Changing the rural environment is more than simply keeping what we have left. It is more than restoring what we once had. We have before us the goal and the challenge of making the rural environment what it can be—an environment so inviting, so pleasant, so fruitful that it will beckon the people of the concrete and asphalt cities to return to the open spaces—and to bring their families, their jobs, and their industries with them.

This is the new concept of conservation. And it is in harmony with the report on *Restoring the Quality of Our Environment*. ♦

A conservation-treated watershed is an inviting rural environment.



Income From Hunting Rights

*Sportsmen turn to pay-as-you-go recreation
where landowners provide for wildlife*

Goose shooting from cornstalk-covered blinds is a paying sport in the Kent County Soil Conservation District near the Chesapeake Bay in Maryland.

By Wade H. Hamor

Biologist, Regional Technical Service Center, SCS, Lincoln, Nebr.

RECREATION as an income-producing resource on the farm or ranch is now widely recognized. Hunting is one of the most popular of the activities that lend themselves to charging of fees. Landowners are learning that they have, on their properties, a salable recreation product in the "right to enter" or "right to hunt."

The recent emphasis on the charging of fees for the use of public recreation land is doing much to break the tradition of free hunting on private land. In addition, the economics of farming and the actions of hunters themselves are guiding landowners into charging for "trespass" rights.

An economic trend

Land values are steadily rising and farm operating costs are increasing. As a result, operators must make each acre more productive of cash income. Because of competition for hunting opportunities, many hunters are reserving good areas for themselves through the use of hunting leases with farmers and ranchers.

In 1964 some Illinois farmers were receiving \$0.33 to \$2 an acre for pheasant hunting rights. One farmer was getting \$3.75 an acre but was managing the land for pheasant food and cover. Also, he was mowing strips through the cover for easier hunting and higher hunter success.

Another Illinois farmer leased 200 acres of his 400-acre farm on a seasonal basis to pheasant hunters at \$1 an acre. On the remaining 200 acres, he charged a daily fee ranging from \$10 a hunter a day at the beginning of the season to





A few rows of corn left standing near good winter cover helps wildlife through the winter months.

\$5 a day for the latter part of the season. His gross return on the 400 acres was about \$1.16 an acre. Cash expenses for advertising, liability insurance, and associated costs amounted to about \$0.09 an acre. This farm is in good pheasant range and about 100 miles from the Chicago area.

In 1962 upland game hunting leases in Wisconsin ranged up to \$1.43 an acre. At the same time leases for waterfowl hunting varied from \$2.50 to \$46 an acre of marshland. The average price was about \$5 an acre.

A survey made in Minnesota 2 years earlier showed that farmers were receiving an average of \$5.10 for each acre of wetland leased to waterfowl hunters. The top was \$13. Not included in these figures were the returns from hunting on "waterfowl passes." These ranged from \$25 to \$2,000 a year. Pits and blinds built by farmers in good waterfowl areas now lease for up to \$500 for the season.

Deer leases pay

Leases for deer hunting in Michigan have ranged up to \$3.12 an acre of farmland. One leased at the rate of \$100 a hunter for the season. In this instance the farmer

managed the land and the deer through proper harvest of the animals, by feeding hay and grain during the winter, and by cutting trees to encourage sprout growth for summer browsing.

Daily fees for hunting deer on some Texas ranches range from \$10 to \$25 a hunter. Season leases are in the neighborhood of \$200 a hunter. Ranchers in that State are grossing \$0.75 to \$1 an acre.

Hunting rights for mourning doves in some Southeastern States cost \$1 to \$3 a hunter a day. The rate usually depends on the amount the farmer has invested in developing good dove shooting fields on his farm.

Value of land

The value of land for hunting as compared to agricultural production is exemplified in the sale of some marshland in California about 3 years ago. A 165-acre marsh was sold to duck hunters for \$1,000 an acre. Developed rice growing land in the same State sold for \$450 to \$650 an acre.

Quality hunting commands the highest prices. Some farms are producing maximum numbers of wildlife and adequate fall cover. Most are not.

The landowner interested in the "hunting area" type of recreation enterprise should endeavor to raise more game and improve the fall hunting cover. The changes and improvements needed must be determined for each farm and each field. Technical assistance in making this analysis is available through soil conservation districts.

The costs and returns involved in the management of hunting areas must be carefully estimated before the operator enters the business of income-producing recreation.

If he need not significantly alter his regular farming operation in order to provide habitat and hunting cover, his costs will normally remain reasonable. Advertising and added liability insurance will be the main expenses.

If, however, he must convert cropland or pasture to nesting or hunting cover, his costs will rise. To be on a sound basis economically, he must compute the costs of conversion and development against expected returns before entering this new activity. ♦

A wildlife area bordered by multiflora rose provides needed cover in a field.



THE RABBITS, deer, wild turkey, and bass of Dent County, Mo., may not know it, but they are being served, like other citizens, by the Dent County standard soil survey report.

Wildlife suitability groupings are made in the report for soils having reasonably similar needs, adaptations, and responses for the production and management of wildlife. They enable landowners to plan improvements in wildlife habitat on the basis of scientific information about soils in much the same way that farmers use capability groupings showing hazards and opportunities in farming and ranching.

Dent County, located in the

Something for everybody . . .

Wildlife, Too, Will Be Served By Missouri Soil Survey Report

By H. E. Grogger

State Soil Scientist, SCS, Columbia, Mo.

heart of the Missouri Ozarks, has always had its fair share of wildlife. In addition to the kinds already mentioned, fox, quail, mourning dove, squirrel, trout, bluegill, and a plentiful supply of resident and migratory song birds occupy the county.

"Research has pointed out the importance of the soil in planning

improved wildlife habitat," says Kenneth R. Hicks, field service coordinator of the Missouri Department of Conservation. So citizens of Dent County decided to work out a guide to better wildlife management through the use of the soil survey.

Soil Survey Party Leader Frederick L. Gilbert assisted by Dean

Scenic Ozark streams have a great potential for developing favorable wildlife habitat. This stream meanders through a narrow valley within the Clarksville soil area in Wildlife Suitability Group 10.





Farm ponds constructed on Lawrence silt loam and Lebanon silt loam are well suited for fish production. This 1½-acre pond has just yielded a 4-pound bass to a happy angler.

Morgan, local SCS soil conservationist, and by members of the survey crew, knew the soils of the county and the interests of the local people. To aid in the soil interpretations for wildlife suitability, Harold V. Terrill, biologist of the Missouri Conservation Commission, was called in.

Habitat elements and wildlife

First off, they listed the major *habitat elements* considered applicable to Dent County conditions. They received good advice from Ralph Work, a soil scientist on winter detail from New York State, where he had had experience with similar interpretations for wildlife suitability.

The Dent County group decided on eight major elements that affect local wildlife. They are grain crops, legumes and grasses, upland and lowland hardwoods, upland conifers, wetland food plants, shallow water developments, and fishponds.

Next, the technicians classified the major wildlife species adapted to Dent County into four major groups having similar habitat re-

quirements:

(1) *Openland wildlife* — birds and mammals that like open spaces. Examples are quail, cottontail rabbit, red fox, mourning dove, and field sparrow.

(2) *Woodland wildlife* — birds and mammals that like wooded areas and woods' edges. Examples are gray fox, fox squirrel, gray squirrel, turkey, deer, ruffed grouse, raccoon, opossum, woodcock, and woodpecker.

(3) *Wetland wildlife* — birds and mammals that like marshes and swamps. Examples are beaver, muskrat, mink, raccoon, ducks, and snipe.

(4) *Pond fish*—fish species commonly stocked in small ponds, such as large-mouth bass and bluegill.

Each soil in the survey was carefully considered as to its suitability for each habitat element for each wildlife group. The suitability ratings determined the logical grouping of soils and the degree of suitability of each soil group for each of the wildlife groups.

Four degrees of suitability were recognized: Well suited, suited,

poorly suited, and unsuited. These classes do not necessarily reflect the economics of producing wildlife. Rather they suggest the relative suitability of the soils for producing the wildlife habitat elements.

The rating for openland wildlife was based on the soil's potential for growing grain crops, legumes and grasses, upland and lowland hardwoods, and upland conifers.

For woodland wildlife, the rating was related to the soil's potential for the establishment and growth of grain crops or wetland food plants, and its desirability for the establishment of shallow water developments and fish ponds.

Ratings for the production of pond fish were based on the suitability of the soil for dam construction and the ability of the soil to provide aquatic fish food as indicated by its potential for grain crop production.

Ten wildlife suitability groupings resulted. For example, Wildlife Suitability Group 4 consists of:

(Continued on p. 182)

Border plantings provide excellent food and cover for openland wildlife. This planting includes bicolor lespedeza and multiflora rose which are adapted to Westerville, Sharon, Dickson, and Humphreys soils (Wildlife Suitability Groups 1, 3, and 6).



A Shooting Preserve in Action

By Verne E. Davison

Biologist, Regional Technical Service Center, SCS, Portland, Oreg.

BEN MATTHEWS, one of the partners who operates the 220-acre Salome Shooting Preserve at Salome, Ariz., greeted me with a friendly smile that Sunday afternoon in October.

Ben had opened his shooting area 2 weeks before. My visit was an official one to see if he and his partner, Oral Hunter, had established a satisfactory shooting preserve according to the conservation plans we had discussed in March. They are cooperators with the Wickenburg Soil Conservation District. Ben is a supervisor.

"I have a party of hunters scheduled to arrive any minute now, Verne," Ben said, "and I want to show you the layout and talk about our operation as soon as they leave."

'Twas an unusual group for a shooting preserve party—two husbands, their wives, and 7 children, the oldest one of hunting age. Mrs. Matthews was there to help entertain the youngsters while their parents hunted.

The hunt is on

At 12:40 p.m. in 95 degree weather, Ben entered his 40-acre irrigated alfalfa field with his German shorthair hunting dog, the 2 men, 1 wife, and the older son. He had released 12 pheasants, 6 hens, and 6 cocks, about 2 hours before noon.

The first cock was flushed quickly; three or four shots were fired, and Ben's dog recovered the wounded bird beautifully.

Then a hen; two shots; dead.

A cock flushed next; two shots missed, and the full-feathered bird flew like a veteran to the shade of a mesquite thicket more than 400 yards away.

The party turned back towards

the preserve pickup, the dog pointed steadily, and a third bird (cock) was killed with one shot by one of the men.

It was 1:05 p.m. Ben and the boy carried the three pheasants to the pickup and the group enjoyed cold drinks and "hunter talk" for 10 or 15 minutes.

Another swing westward through the alfalfa field soon bagged the fourth bird, a hen brought down by the lady with her second shot after missing the first. The next bird flew safely into an adjoining field of ripening pearl millet, the hunters missing with both shots fired.

As the dog pointed the seventh bird, a nearby one flushed without drawing any fire, but the hen that flushed from the dog's point was harvested with two shots in unison. I watched another cock sneak out of the alfalfa and run across the field road to the pearl millet.

I left the hunters, for I wanted to see the holding pens and the other 200 acres of the preserve. I noticed the party returned to the camp at 2:30 p.m., and they were gone when I arrived there about 3:00. They had exchanged their seven hens and two cocks for nine cleaned birds from the refrigerator.

The cropping plan

The Salome Shooting Preserve is part of a small irrigated area in the desert valley and hills region of western Arizona. Ben Matthews and Oral Hunter grow alfalfa, cotton, pearl millet, safflower, and the best strains of lovegrass and blue panicgrass seed. They have planted several 20-foot strips of grain sorghum at 200-foot intervals across the various fields for the pheasants.

Ben and I examined the contents

of the crops of the nine pheasants taken that afternoon. They had eaten milo (grain sorghum) seeds and green alfalfa leaves. Later in the evening, I watched several pheasants feeding on pearl millet and milo and watering at the irrigation ditches.

Buys pheasants

The Salome Shooting Preserve buys mature, fully feathered pheasants in lots of 500, half hens and half cocks, at \$2.50 a bird as needed from commercial producers. The birds are housed and fed correctly, in suitable pens on the farm, until released for hunting. The climate is favorable for winter pheasant hunting, but it does not provide habitat for natural pheasant production.

There is moderate expense in the use of farmland for the hunting venture. The operators furnish the hunting dogs, go with the parties, and hunt only one party in any half-day. A party of two is ideal, three is more difficult, and four is considered dangerous. Coffee and cold soft drinks are free to their guests any time, and beer is offered *after* the hunt.

The charges? Twenty-five dollars a person for three pheasants, plus \$6 for each additional bird, and 50 cents for cleaning each bird, if desired. A season privilege for taking up to 100 pheasants is offered at \$600.

The margin of profit is minimum, but adequate to pay the investment and labor costs—enough to encourage the owners to stay in business and reward them for their services and the use of their land.

The shooting preserve is one of the answers to winter recreation and income-producing hunting in Arizona. ♦

New Uses for Farm Woodlands

Today's owners put varied aims into conservation plans

By Ross H. Mellinger

*Woodland Conservationist, SCS,
Morgantown, W. Va.*

MOTHER NATURE has sown countless tree seeds on abandoned farmland across the country. Combined with the efforts of conservationists, this has resulted in the disappearance of thousands of acres of open land beneath the growth of millions of trees.

This has added to the already large acreage of privately owned woodland and to the number of woodland owners who have interests in their woods other than growing timber. Recreation, esthetics, and wildlife values are beginning to be strongly featured in recent conservation plans.

Whatever their interests and plans, most landowners have need of and confer with a soil conservationist who can help them develop a farm conservation plan tailored to their needs and objectives.

Once decisions are made and recorded in the basic conservation

plan, the landowner is referred to a professional forester if he wishes to develop a detailed management plan for growing timber.

THEY MAY BE RETIRED. The couple (above) may say to the soil conservationist, "We bought this place to spend our retirement years enjoying the study of nature. We would like to have some foot trails to get into the woods."

They want to have the trail skirt the rock ledge on the ridge; go close by the old twisted oak that Indians bent to mark a hunting path; and go through the different soil areas. They want to prune off low-hanging limbs; cut the dead trees that might fall across the trail. They don't want to harvest timber.

These decisions make up their plan. They ask their soil conservation district to furnish equipment and labor to help them do the work.

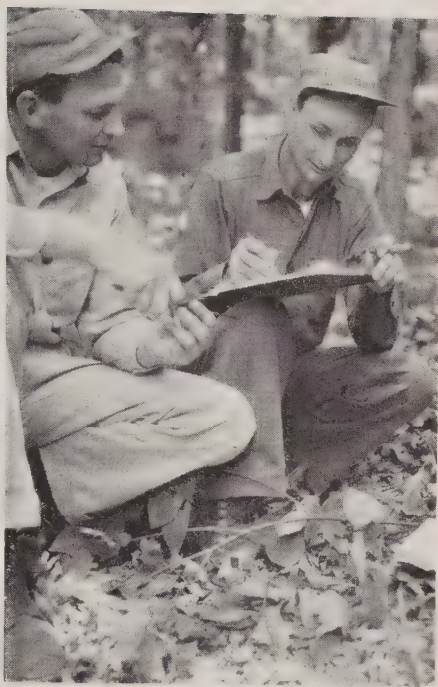


WILDLIFE may be the main interest of a new owner (below) who has inherited the old home place. He explains, "Dad left the old home place to me. I'm not going to farm it; just want to develop it as a place to hunt deer, grouse, and squirrels. I'll sell some timber, but only if it will help improve hunting."

A habitat appraisal shows the need for cleared strips through the woods to improve feeding places for deer and grouse. The strips are planned to go where the timber is ready for harvest.

Access roads are needed to reach the far corners of the place by jeep. Seedlings for the roads are designed to attract grouse. The roads are also good fire insurance.

Thinnings are planned in pole timber to give plenty of space to the crowns of shagbark hickories and oak. This will improve production of mast. Den trees are retained in the hollows and around the border of the woods.



SOME ARE YOUNG MEN with growing families (above). They are conservation-minded but conservation must pay its way.

One of them said recently, "Sure I enjoy hunting, but I've got to make this place pay out. I need to sell some trees for steady income. How can I handle this 100 acres of woods so that new and better trees are always coming on?"

The soil conservationist first ex-

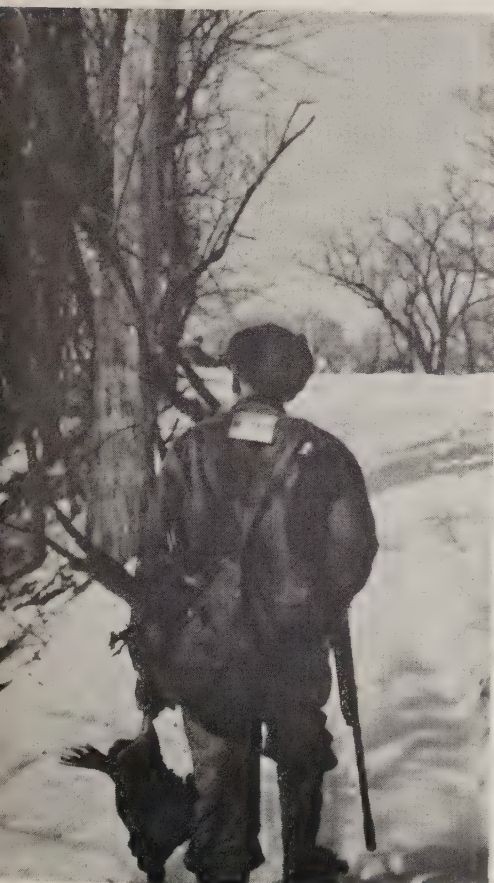
plains the soil map and the effects of soils on tree growth and management. Then he helps the owner size up the woods. What kinds of trees are there? What sizes? Quality? Are there too many or too few for best growth? What products can be sold? What conservation practices are needed for protection and improvement of the woods?

When decisions are made and recorded in the basic conservation plan, the landowner is referred to a professional forester.

RECREATION for income (below) is catching the attention of some woodland owners. One said the other day, "I've got a woodlot down by the new road. Might be a good spot to bring in picnickers and campers. I'd like to get some ideas on the possibilities."

Here again the soil map gives some basic information about how drainage, slope, rocks, and other soil features might affect the use of the area.

Plans for treatment of the tree cover involve such things as different degrees of thinning for tent sites and picnic areas; developing natural shrubs for screens, barriers, or landscaping. One thing



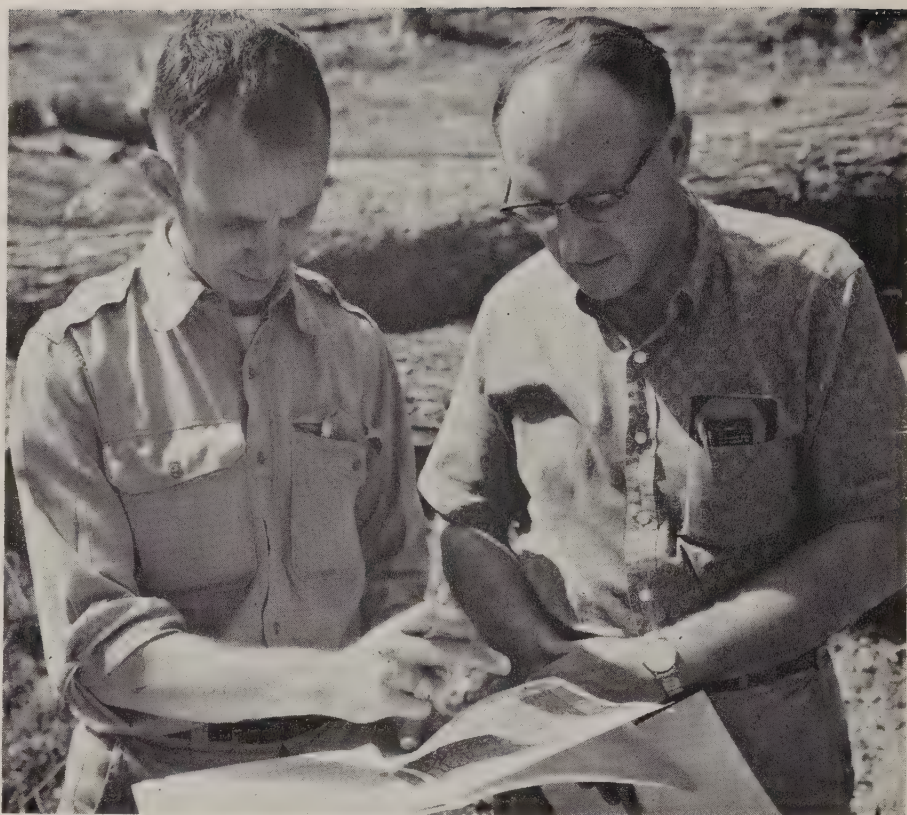
is sure—the practices planned will be far different from those used to grow wood products.

WOOD USING industries in many areas are purchasing small tracts of land and combining them into large tree farms. Management of these lands is in the hands of professional foresters (right). One of them says, "As an industrial forester, I've got to make a profit in the woods for my company. To manage this large property we've got to know the soils and their effects on forest growth. I'm a firm believer that tree farming begins with the soil."

For these people, soil maps are the foundation for forest management. When interpreted by soil conservationists they help foresters fit the best kinds of trees to the soil; predict potential yields of wood crops; help decide on what size trees to grow; make tentative locations for woods roads; guide decisions on multiple use; and help cope with soil-related problems like erosion hazard and difficulties in the use of equipment.

So, these days woodland conservation means different things to different people. Soil conservationists are helping landowners define their needs and develop conservation plans which are realistic and useful. Foresters, biologists, and other professional people use these basic plans when the landowner calls on them for specialized help.

Soil conservation districts are finding a growing need to supply services to these new landowners. For example, it is quite common now in West Virginia for an absentee owner to order a planned tree planting job. The district orders the trees, cares for them, prepares the site, builds the fence, and plants the trees at the proper time. This is a sign of the changing times. It points out the need for soil conservationists to recognize the "new look" in woodland conservation and the opportunities it creates. ♦



Wildlife too

(Continued from p. 177)

Lawrence silt loam, 0 to 1 percent slopes.

Lebanon silt loam, gray subsoil variant, 0 to 1 percent slopes.

Robertsville silt loam, 0 to 1 percent slopes.

With good management these soils are well suited for grain crops and most grasses and shallow-rooted legumes. Upland and lowland hardwoods and upland conifers do not grow well on those soils; wetland food plants usually do. Shallow water developments and farm ponds are normally successful, as are wetland wildlife and pond fish development.

The soils of Group 4 are suitable for the production of wetland wildlife and pond fish. Management suggestions for wetland wildlife are: Exclude livestock from ponds and lakes to protect aquatic plants that grow along the water's edge. These plants are important as food, nesting cover, and winter cover. Create shallow water areas (3½ to 5 feet deep) by building dams across waterways or by

digging in soils having high water tables. When possible, plan to control the water level. Food plants are grown and made available to wildlife by draining or flooding an area at the proper time. Also, unwanted weeds can be controlled by manipulating the water level.

Management recommendations for each wildlife group adapted to each soil group are summarized in the wildlife section of the soil survey report. Detailed specifications are available or are being developed by local conservation technicians assisting the Dent County Soil and Water Conservation District.

Local supervisors of the district feel that the soil survey and the interpretation into wildlife suitability groupings give them the fundamental information for aiding local landowners who wish to improve their wildlife crop. It is their belief that hunting and fishing is an honorable and satisfying activity, and they aim to encourage and help in its development for the betterment of the community. ♦



This Is a Marsh— Mark it Well

By David N. Allan

Biologist, SCS, Durham, N. H.

THE SUN glints on the ruffled surface of the marsh. Rushes and sedges weave back and forth in a dance that creates ever-changing shadows on the water. A red-wing clings to a cattail head as he calls out a warning that this is his home. A sandpiper teeters back and forth picking up some choice morsel and startling the chorus of spring peepers.

This is a marsh; a never-still place of ever-changing pattern from winter's ice crystals glinting in the sun to the splash of an autumn flight of ducks.

This is the marsh that many landowners see and cherish. To them it is a source of enjoyment and beauty—not waste land to be drained or used as the town dump.

Let me tell you about some landowners who like marshes.

Farm and sawmill

Peter Braase of Strafford, N. H., owns a small farm and sawmill. His farm is a pleasant place with

fields sloping down through an orchard to a low area that was formerly wetland. There are birdhouses on fence and barn that tell you he likes wildlife. The wet spot has now become a combination pond and marsh. Trout break water in the deep pool by the dam, and ducks feed and nest in the shallows at the upper end. Here are 3 acres of new wetland providing a great deal of family enjoyment.

Flooded woodland

In Rochester, N. H., William Champlin owns large areas of managed woodlands, including about 10 acres of flooded hardwoods. Areas have been cut to create open water. Walking the farm road through tall pines you suddenly come upon the flood area. In spring the brushy growth around the edge is filled with the calls and bright flashes of color of migrating warblers. Fall brings a chance for duck hunting. Autumn brings the thrill of seeing black ducks rising with

a splash on a cold frosty morning or a flock of teal dropping straight down through the dead trees before the blind.

Swimming pool

In Amherst, N. H., the Lane Fearons have become marsh enthusiasts. What started as a desire for a swimming pool led them to a pond and marsh which offered privacy not found on local lakes. They found the site in an apple orchard. A small stream with an abandoned beaver dam showed them the possibilities. With the help of the Soil Conservation Service, the old dam was removed and replaced by a large earthen dam complete with means of drawing the water down.

The Fearons say, "An unexpected result of the construction was the new interest the family has in the out-of-doors. We hunt some, target practice with gun and bow, do bird watching, and just plain walk. The marsh has become quite a wildlife refuge."

They have built a home on one side of the pond while their daughter's family is building on the other. The elder Fearon's home has a porch hanging out over the water. With large sliding glass doors it brings the pond and marsh into the living room. It is like

Decoys grace the placid pond of one of New Hampshire's new wildlife marshes.



watching a wildlife movie on a wide screen. Muskrats swim by, pushing marsh plants before them. Wild ducks wheel back and forth before skidding in to a landing. Deer come down through the orchard to drink. They have Canada geese, beaver, raccoon, pheasant, ruffed grouse, and woodcock and have even seen bear tracks. The wild things seem little concerned with the human activity around them.

Native shrubs

Many native shrubs bloom along the shores and provide food and nesting cover for birds and animals. On one shore the brush was cut back to bring out the colors of dark green and pink of mountain laurel against a background of white birch.

Lane Fearon has cut lanes, wide enough for a canoe, through the flooded woodlands and placed woodduck boxes in the trees. Pileated woodpeckers create new nests in the drowned out trees.

As the Fearons say, "This family project, begun as recreation for the family, has become much more. It is now a place of deep satisfaction and learning for all of us, including our 2-year-old grandson who on a recent occasion greeted our arrival with a partially asleep snake. It's become a haven for photographer friends, and the warm feeling of pride we get when we see or hear our animals is something one must experience to understand."

Small marshes along the seacoast



A cottage on the shore invites the visitor to linger by a wildlife pond in the Rockingham Soil Conservation District near Deerfield, N. H.

attract shore birds. One such marsh in a field next to tidewater has given the owner the pleasure of seeing more than 30 species. They nest there or stop off on the spring and fall migrations. Such marshes help fill the needs of sea birds for fresh water for drinking and bathing.

Community project

Marshes can also become a community project. The town of St. George, Maine, had the problem of repairing a 200-year-old stone bridge on tidewater. The selectmen consulted their local soil conservation district and State highway department for help. By joint effort a small marsh of 10 acres was built. The old bridge was removed and a pipe was laid under the road which forms part of the dam. The marsh has been set aside as a nature area for the townspeople with the right to use the land generously donated by the landowner. It has been named the Watts Cove Wildlife Marsh in memory of Harold Watts, a conservation district supervisor who died shortly after its creation.

In Randolph, N. H., the towns-

people have built an 8-acre pond and marsh. Technical assistance was provided by SCS through the Coos County Soil Conservation District. It is part of a town-owned recreation area and fits into the planned land use for nature enthusiasts. The marsh is beside a highway used by summer vacationers. It adds to the natural beauty of the area as it lies at the base of towering Mt. Jefferson in the Presidential Range of the White Mountains.

Five years ago we held a training session for New Hampshire SCS personnel on planning small marshes. At that time there were only 2 or 3 marshes to be shown. Today there are 18 scattered around the State that have been designed and built under the supervision of SCS personnel. More are being planned each year as people realize that they can receive technical help.

It is satisfying to know that people are saving valuable wetlands. New bodies of water and wildlife habitats are being created. Most of them have not been built for a cash return but for the personal enjoyment they provide. ♦

Trout Is New Cash Crop for Tennessee Farm

THE MONEY-MAKINGEST field on John Willy's farm in Hickman County, Tenn., is covered with cold, clear water.

Willy bought 1,015 rolling highland acres in 1950 and launched out on a conventional farming operation.

Much of the farm's open land was idle at this time. Willy became a cooperator with the Hickman County Soil Conservation District in 1952. His early interest was beef cattle and sheep. His first conservation plan called for 153 acres of perennial pasture, 32 acres of alfalfa for hay, 58 acres of cropland for grain and silage, and 500 acres of woodland.

As Mr. and Mrs. Willy went about their daily chores, they kept studying a spring that flowed from under a limestone bluff just across Beaver Creek from their comfortable old-fashioned frame house.

"A spring as clear and cold as that," John Willy said to himself, "should make a good home for trout."

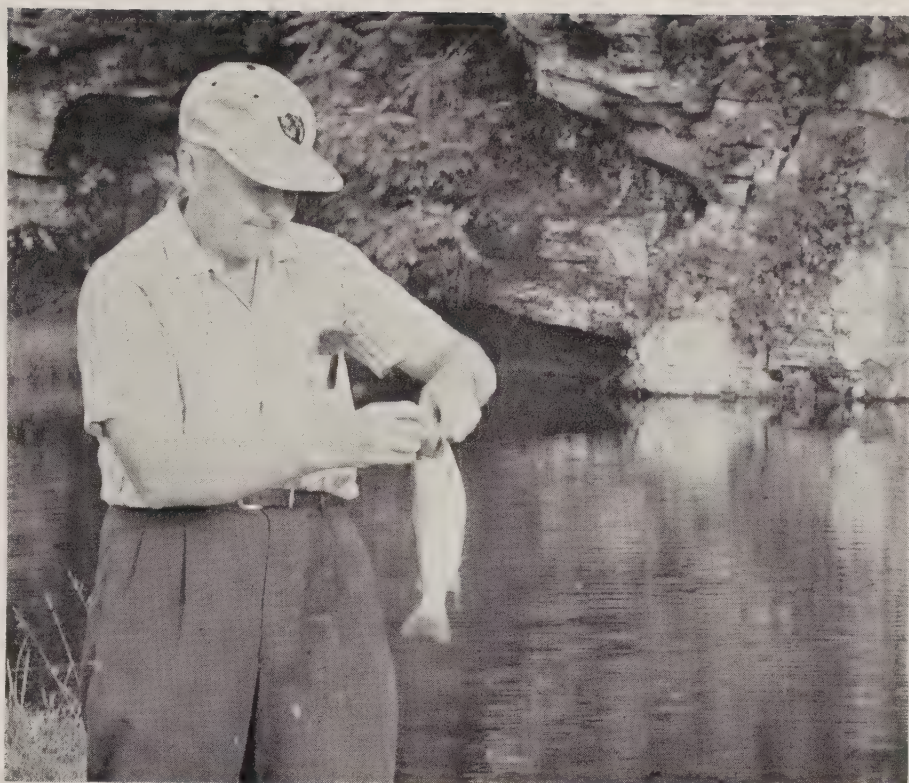
A small pond at the spring outlet was enlarged to about an acre. Trout fingerlings for a trial were provided by the Game and Fish Commission.

"This was not a commercial attempt," Willy said. "We could not sell the trout furnished by the Game and Fish Commission, but, boy, we grew some whoppers. We *knew* that trout would thrive here."

After further consultation with the Game and Fish Commission and SCS biologists, Willy went into the trout business for income.

Four raceways—shallow pools fed by cool overflow from the pond—were constructed. He built a "nursery" in which to hatch his commercially purchased trout eggs.

Willy raised 15,000 trout in 1962



SCS Assistant State Conservationist N. I. Brown is a customer at John Willy's trout farm.

and had them to catching size by April 1, 1963.

"The crop lasted 3 months," he said. "The first month paid for the construction of the pond and raceways, the second month paid for the trout and the feed, and the third month was profit."

Willy says that the trout enterprise has "out-yielded every other cash crop on the place."

For fishermen who want to go all the way, the Willys are preparing a 44-acre camping area, which will be accessible by car and will have cooking units and sanitary facilities.

Through the Cropland Conversion Program, Willy constructed a 3-acre warm water pond for catfish. SCS gave technical assistance on these projects.

Other conservation practices on the farm include crop rotations, pasture, sod waterways, ponds for livestock water, and tree planting.

Because of their close cooperation with the Hickman District, the Willys are considered part of the family by the Hickman board of

supervisors. In 1964, Mrs. Willy was selected to represent the board at the National Association of Soil and Water Conservation Districts' Convention at Kansas City, Mo.—
TILLMAN E. LEE, *Area Conservationist, SCS, Columbia, Tenn.* ♦

Pond Development Benefits Area

A major pond development program of the Scott County Soil Conservation District, Miss., started in 1946, helps bring prosperity to the area.

Before that time, many farmers hauled water for livestock in the summer from large ponds of neighbors and from nearby creeks.

Now there is a flourishing livestock industry, and much of the cutover second growth timberland and overcropped land has been converted to permanent pastures.

Altogether 2,176 SCS-designed ponds have been built, with 211 ponds in 1965 alone, and more than 100 built annually in 5 out of the last 8 years. ♦

Many Nations in Soil Congress

Nearly every nation in the Western Hemisphere is represented in some way in the First Pan American Soil Conservation Congress coming next month in Sao Paulo, Brazil.

At the Congress scheduled for April 12-29, speakers will discuss the great opportunities that modern science and technology offer for land and water resource development in the Americas to meet rising needs for food, improve the welfare of rural people, promote economic growth, and increase foreign exchange earnings.

More than 500 people are expected to attend.

Major speakers at the meeting will include conservation authorities from several nations including SCS Administrator Donald A. Williams, and ASCS Administrator Horace D. Godfrey.

Nine SCS employees will present papers at the Congress. ♦

SCS Team To Help Thailand Farmers

Four veteran SCS conservationists left recently for northeastern Thailand, where they will spend the next 2 years helping Thai farmers under an AID agreement.

The team will work with the Land Development Division of the Thai government. They will train Thai technicians in working with local government officials and farmers to improve the agriculture of northeastern Thailand. The training will be in techniques of soil and water conservation, good land use, cropping patterns, irrigation improvements, and use of soil amendments.

The team also will give training in techniques of improving range and pasture resources to permit an increase in the livestock enterprise.

Improvements in soil and water resources and farming methods will

enable Thai farmers to increase their income as well as meeting increasing needs for food.

Team leader is J. Dale Schott, Iowa assistant State conservationist. Other members are Darrell L. Gallup, soil scientist, Hyattsville, Md.; Charles A. Bordsen, work unit conservationist, Glendive, Mont.; and Clyde T. Lowe, work unit conservationist, Payson, Utah.

Schott and Gallup will be stationed at Bangkok, while Bordsen and Lowe will work out of Khon Kaen.

Northeastern Thailand is characterized by a shifting type of agriculture, in which land is plowed and cropped—mainly in dryland rice—for two or three seasons and then allowed to return to brush for 6 to 10 years before it is plowed again. Rainfall is sparse except during the monsoon season. ♦

Pasture Pump Protects Ponds

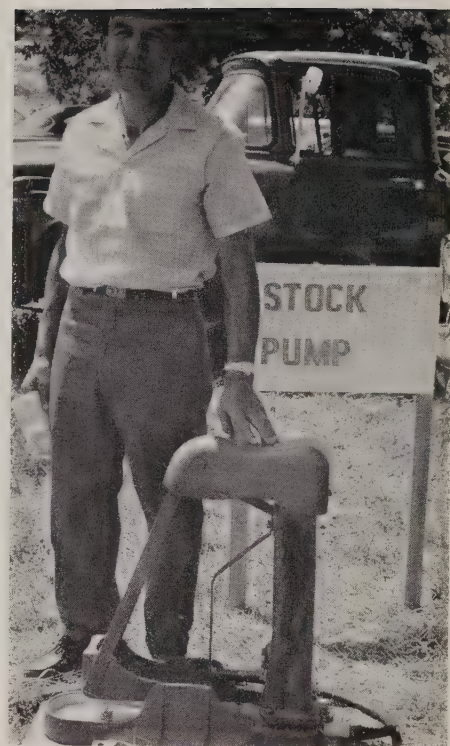
A NEW TYPE of pasture pump is providing a solution to the problem of trampled shores and muddy water in dugout ponds where water for livestock cannot be piped by gravity to a tank outside a protective fence.

Supervisors of several soil conservation districts in Vermont keep a supply of the pumps for sale to cooperators for immediate installation.

The pumps are automatic and designed so that cattle, by their drinking action, can pump their own water, clear and fresh from protected ponds. No electricity, labor, or supervision are required.

There are at least two designs on the market, and they have solved many cattle-watering problems. One pump is a displacement type piston unit with double stroke action. It has a vertical lift of up to 24 feet and a horizontal suction to 300 feet. It will supply 6 gallons of water a minute to its trough of 2 quarts capacity.

Experience is convincing many



District Supervisor Gerald Sawyer shows off a livestock water pump in a visit to the soil conservation district, Vermont.

district cooperators that the new cattle watering method works well with modern conservation practices. In the White River and Otter Creek soil conservation districts farmers are switching from dugout ponds to pasture pumps.

Wes Larrabee, a farmer in Shoreham, Vt., said his cows prefer the water from two pasture pumps over regular pond water or a running brook.

No longer do cattle have to wade into ponds, pushing in the sides, muddying the water. Farmers are spared the further problem of mud-caked udders at milking time, and with ponds fenced off grass grows down to the water's edge providing a more attractive and healthier impoundment.

Maintenance is very high on ponds that are not fenced off from cattle, and some need to be re-dug every 5 years.

Most County ASCS Committees in Vermont have voted ACP cost shares on pasture pumps.—ROBERT E. COLLINS, Work Unit Conservationist, SCS, Middlebury, Vt. ♦

Potomac Model Plan Stresses Land Treatment

THE *Potomac Interim Report to the President*, recently submitted by the Secretary of the Interior in response to the President's directive that a "model conservation plan" be prepared for the Potomac River Basin, makes soil and water conservation a major part of the proposed program.

One of eight summary paragraphs recommends:

"That soil conservation measures for the reduction of erosion and sedimentation and the construction of small headwater reservoirs be accelerated and that the George Washington National Forest be expanded to provide public access to the North and South Forks of the Shenandoah above their confluence."

The other recommendations propose an extensive program of park and recreation developments and the preservation of natural areas and wild rivers.

More detailed recommendations backing up the published report provide for a 10-year program stepping up Federal, State, and local land use adjustment and treatment activities of the kind carried out under authorities of the Department of Agriculture.

These include accelerated conservation work on farms, small watershed projects, erosion control on highways and secondary roads, completion of the soil survey in the basin, and immediate construction of upstream watershed structures primarily for recreation purposes at about 40 sites within the national forests.

The report also recommends extension of existing authority for upstream watershed improvements such as are now being carried out under the 1944 Flood Control Act to the entire Potomac basin.

The interim report was prepared

by the Federal Interdepartmental Task Force on the Potomac, consisting of Kenneth Holum, Assistant Secretary of the Interior, chairman; John A. Baker, Assistant Secretary of Agriculture, who was represented by Hollis R. Williams, Deputy Administrator for Watersheds of SCS; Eugene W. Weber, Deputy Director of Civil Works, Chief of Engineers, representing the Department of the Army; and James M. Quigley, Assistant Secretary of the Department of Health, Education, and Welfare.

Also participating was a Potomac River Basin Advisory Committee, consisting of three representatives each of Maryland, Pennsylvania, Virginia, West Virginia, and the District of Columbia under the chairmanship of James J. O'Donnell of Maryland.

Technical material was developed and considered by subtask forces of the Interdepartmental Task Force composed of representatives of the participating and some other Federal agencies and the States.

The subtask forces were: (1) Sedimentation and Erosion, H. O. Ogrosky, SCS, chairman; (2) Water Supply and Flood Control, H. E. Schwarz, Corps of Engineers, chairman, with Carl D. Fetzer, SCS, representing the Department of Agriculture; (3) Water Quality, Keith Krause, Public Health Service, chairman, with Lloyd M. Reed, SCS, representing USDA; and (4) Recreation and Landscape, Robert M. Paul, Department of the Interior, chairman, with Ralph C. Wilson, SCS, and S. L. Cuskelly, Forest Service, representing USDA. ♦

Cooperation in RC&D Projects

In Resource Conservation and Development projects all segments of the community—rural, suburban, and urban—can work together to solve local problems and improve resource use. Local groups must initiate projects. ♦

Woodland Managed as Sugar Bush

(Photo on back page.)

FOR 25 YEARS Ralph C. Grosvenor of Claridon Township, Ohio, has produced an average of 350 gallons of maple sirup a year on his 20-acre managed woodland. He also has harvested over 141,000 board feet of timber by regularly thinning out his trees to improve his stand.

Grosvenor has been a cooperator with the Geauga County Soil Conservation District since it was organized in 1944. With the help of SCS technicians, he has carried out a basic conservation plan on his 170-acre farm.

The farm has been in the family since the early 1800's and maple sirup has been produced there since soon after the Civil War. Ralph Grosvenor took over the management of the farm from his father about 1920.

In the management of his woodland, Grosvenor's primary aim has been improvement of the sugar bush. He started his woodland management program in 1941 as a USDA forestry project. In 1944, Grosvenor made the first of three selective timber cuttings, scheduled at 5-year intervals to permit proper root development and to reduce wind damage. He sold the cut timber as logs, sawed lumber, and blocking. He used scrap logs and limbs for fuel.

After the final selective cut in 1959, Grosvenor and the farm forester, Ohio Division of Forestry and Reclamation, developed a timber stand improvement program to remove remaining unwanted woodland growth.

Today, Grosvenor manages a neat and thrifty woodland where a few bramble patches remain to provide good environment for wildlife and protection for hardwood seedlings.—GEORGE J. NEWBERGER, *Work Unit Conservationist, SCS, Burton, Ohio.* ♦

Farm Plans Build a New Community

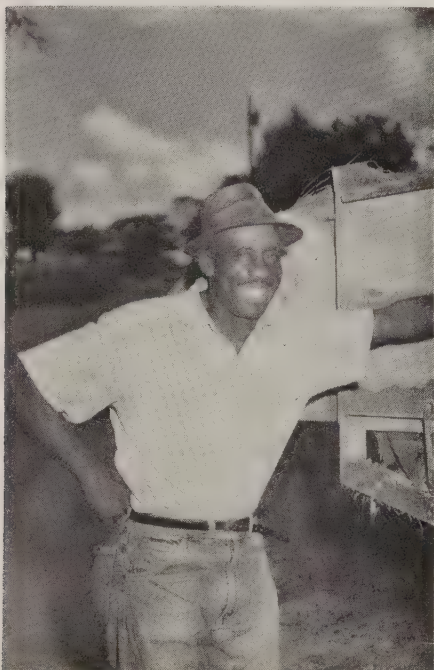
THROUGH cooperation with each other and diligent attention to their farm plans, land owners and operators in Florida's Holmes Creek Soil Conservation District have developed a successful farming community in the "worthless redlands" of the State's Panhandle Section.

The land in the Holmes Creek District is highly erodible, and for many years crops were planted in the bottoms where soil couldn't run away.

Even under this system, however, the fields were ruined by sediment from the highlands where gullying was severe, and farmers barely made out with a few rows of corn and some cotton.

Today, under conservation practices the land in the area is considered some of the best in Holmes County, and new farm machinery, as well as the old in good condition, indicates a measure of prosperity. The farms vary in size from just a few acres to several hundred. All the land owners and

Leonard Gainer, Holmes SCD cooperator, has the proud look of a successful farmer as he stands beside his peanut combine.



Holmes Creek SCD Cooperator Marvin Long gets some facts about his farm plan from Work Unit Conservationist Malcolm Reddoch.

operators are Negroes.

Typical among the 30 to 40 farm families is Leonard Gainer who farms 120 acres of his own and 80 acres of rented land in a community where many people are related and the Gainer name is most prevalent.

Malcolm Reddoch, Work Unit Conservationist in the Holmes SCD, said Gainer's father, Will, was the first Negro cooperator in the district. It impresses Reddoch that the people keep their farm plans right up to date. Many of them call him at least three or four times each year for assistance.

"Not only do they keep the plans up to date," he said, "they keep them handy where they can be referred to any time they are needed."

This is the spirit throughout the district where one farmer brings his striperop or contour up to his landline and his neighbor continues the practice on his land.

A short distance from Mr. Gainer's place is the 140-acre general farm of Marvin Long. Mr. Long has been a cooperator for only little over a year, but has completed a parallel terracing sys-

tem, and next season he plans to put in grassed waterways.

He said gullies had become a problem and crop washouts were frequent. Now things are changing rapidly for the better and he credits the soil conservation practices he installed recently.—RAYMOND A. DAY, *Soil Conservationist, SCS, Gainesville, Fla.* ♦

New Wildlife Board to Advise USDA

Secretary of Agriculture Orville L. Freeman has appointed a Wildlife Advisory Board to advise and consult with the Department in setting up the new Cropland Adjustment Program, authorized by the Food and Agriculture Act of 1965, aimed at removing from surplus production up to 40 million acres of cropland.

Emphasis will be in shifting this land into public-benefit uses which will also conserve soil, water, and wildlife to meet future needs.

The board includes:

Edwin A. Jaenke, associate administrator, Agricultural Stabilization and Conservation Service, chairman; Harry L. Graham, National Grange; Clinton R. Guter-muth, Wildlife Management Institute; Dr. Weldon K. Haynie, chairman, Oklahoma State Game and Fish Commission; James A. Hodge, farmer, Mullins, S. C.; Thomas L. Kimball, executive director, National Wildlife Federation; Otto C. Maerklein, Jr., North Dakota Wildlife Federation; Phillip W. Schneider, director, Oregon State Game Commission; James T. Shields, director, Minnesota Game and Fish Division; William E. Towell, director, Missouri Conservation Commission; and Lester P. Voigt, director, Wisconsin Conservation Department.

Lloyd E. Partain, SCS, will be a consultant to the board and chairman in Mr. Jaenke's absence. Fred G. Ritchie, ASCS, will serve as executive secretary. ♦



CONSERVATION PROFILE

Seavey A. Piper

Maine

Conservationist still runs farm of his boyhood

GIANTS come in many sizes! Seavey A. Piper, though small in stature, is a giant in the field of soil conservation.

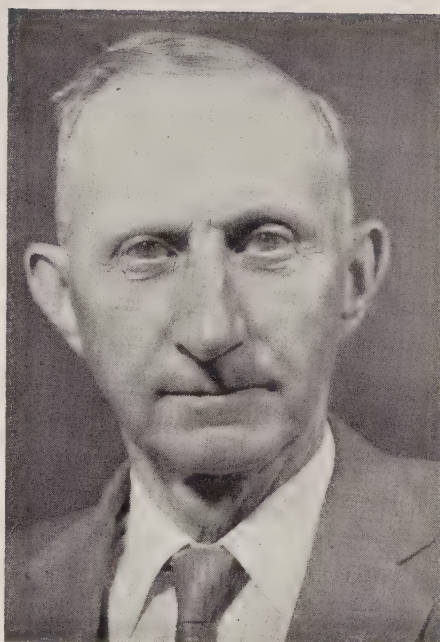
Mr. Piper's home town is Troy, a small Maine farming community 30 miles south of Bangor. There he gained his first farming experience as a lad of 8 when he carried the lantern for his uncle on early morning and evening chores. Today, he and his son Clinton operate the same 350-acre farm together. In the meantime, he has won a reputation for conservation leadership in his own Waldo County and throughout the State of Maine.

While still a young man, Piper noticed the erosion on his farm and was concerned about it. When the Waldo County Soil Conservation District was formed, Piper was one of the first farmers to apply soil conservation practices on his land.

He has served as a supervisor of the district for the past 14 years, including 2 years as chairman. Now he is secretary-treasurer of his home district and chairman of the State Soil Conservation Committee.

Piper's formal education began in a one-room school. After 3 years of high school and a 2-year course in agriculture at the University of Maine, he returned home to take over the management of the farm.

Each year Piper travels hundreds of miles promoting the conservation and development of natural resources. Well known and



highly respected by many Maine legislators, he led the campaign which resulted in the revision of the State Soil and Water Conservation District Enabling Act. He has appeared many times before State hearing committees promoting soil and water conservation.

In 1949, the University of Maine honored Mr. Piper as one of Maine's Outstanding Farmers. Recently he was selected as the Outstanding Conservationist by the Northeast Chapter of the Soil Conservation Society of America.

He has served as a selectman of his town for nearly 30 years. Among other duties, he has been active in 4-H Club work, the Farm Bureau, and Extension work. ♦

Ponds Stop Water Hauling on Farm

Ponds built on a 140-acre farm near Lake, Miss., put an end to hauling water in drums. H. W. Hollingsworth, who moved to Lake 3 years ago, says "I have four ponds and they really help me out. I'm proud of them. They were hauling water to this place in drums when we bought it. There's no running water through here. There's a little creek but it dries up."

These ponds helped in establishing a fine beef cattle operation. ♦



Quality of the Environment: An Economic Approach to Some Problems of Using Land, Water, and Air. BY ORRIS C. HERFINDAHL AND ALLEN V. KNEESE. 1965. *Resources for the Future*, Washington, D. C. (Johns Hopkins Press, Baltimore). 96 pp., paper. \$2.

This publication is the report of one of Resources for the Future's studies of the "quality of environment" as affected by some uses of land, water, and air. It presents results of the study and proposes a research strategy for continuing surveillance of the problem.

To the question, "When are we going to run out of our natural resource products?," the authors reply, "Long before that happens we will suffer a deterioration in the quality of our environment."

Whatever the degree of deterioration, economic reasoning can aid in formulating a plan to minimize its detrimental effects; "namely, the balancing of our varied desires in these matters against the costs of satisfying them in various degrees."

The need for investigators to have knowledge of several scientific disciplines is emphasized. It is especially important for economists studying environmental qualities to know something of the natural sciences and engineering subject matter involved.

The major environmental problems are: (1) Water pollution, (2) air pollution, (3) use of chemicals as pesticides, (4) use of urban space, and (5) use of rural areas.

Each problem is considered in a separate chapter, considering ways in which improvements might be made. The conservation program of the Soil Conservation Service is deeply involved with each of the

five major environmental problems.—T. B. PLAIR, *Woodland Conservationist*, SCS, Washington, D. C.

Trail Planning and Layout.

By BYRON L. ASHBAUGH. 1965. *National Audubon Society*, New York. 104 pp., illus. \$2.50.

This book is a welcome treatment of a phase of outdoor recreation of rapidly growing importance. While the trail is only a means to an end, it is often the major development on areas devoted to the enjoyment of natural areas and nature education. How well the trail is conceived, designed, built, and fitted with interpretive facilities determines its usefulness.

There are *kinds* of trails according to the subjects observed, such as woodland, vegetation, animal homes, wildflowers, soils and geology, and the like. Or, they may be classed according to the kind of environment, such as forest, wilderness, farm, or underwater. Too, the mode of transportation may classify the trails, as hiking, horseback, cycling, or boating. These and others are covered in this volume. Only trails for use by power vehicles — motorcycle, snowmobile, etc.—are omitted, possibly with intent.

Chapters cover background and perspective, design, construction and maintenance, trail features, signs, labels and guides, and teaching on the trail.—F. C. EDMISTER, *Resource Development Division*, SCS, Washington, D. C.

Wildlands in Our Civilization.

EDITED BY DAVID BROWER. 1964. *Sierra Club*, San Francisco. 175 pp., illus. \$5.75.

This book, mainly a collection of essays and statements from previous publications of the Sierra Club, brings together in one place an exposition of the concept of wilderness as a land use and the reasons for a National Wilderness System.

A foreword by Editor Brower and an introduction by Wallace Stegner, both well-known spokes-

men for the wilderness idea, restate their case for the wilderness bill, which was enacted into law at about the time the book went to press.

Eight choice papers from the first five Biennial Wilderness Conferences and related essays elucidate the wilderness theme. The book concludes with abbreviated summaries of the five conferences.

As usual with Sierra Club books, handsome photographs superbly reproduced speak fully as eloquently as the words.—B.O.

Wildlife Biology. By RAYMOND F. DASMANN. 1964. *John Wiley and Sons, Inc.*, New York. 231 pp., illus. \$5.95.

Anyone seriously concerned with the welfare of wildlife should read this book. It is an introduction to the basic biologic principles of modern wildlife management.

The book is not long, only 231 pages of which about 35 are used for illustrations. The writing is concise and the reasoning exceptionally clear.

Especially recommended are chapter 3 on ecological ideas, chapter 4 on wildlife habitat, and chapter 10 on wildlife and land use. Dasmann has a refreshingly realistic understanding of the key role of the private landowner in the production of fish and wildlife.—LAWRENCE V. COMPTON, *Head Biologist*, SCS.

New Publications

The Great Plains Conservation Program. 1965. *USDA PA* 669. 16 pp., illus. Updating the record of progress of the program, this report shows that 395 counties in the 10 Great Plains States are now eligible for help, 19,900 farmers and ranchers are cooperating, and 39,200,000 acres are covered by complete soil and water conservation plans. It also gives statistics on the acreage of unsuitable cropland converted to conservation uses and conservation practices applied with cost-sharing.

What Is a Farm Conservation Plan? By SOIL CONSERVATION SERVICE. 1965. *USDA PA* 629. 8 pp., illus. Superseding Leaflet 249, "What Is a Conserva-

tion Farm Plan?," this bulletin explains the need for a plan and how to make one and describes the assistance available from the Soil Conservation Service through local soil conservation districts.

Further Reading in Land Use Biology

The following publications by SCS biologists are available from the Soil Conservation Service:

Making Land Produce Useful Wildlife. By WALLACE L. ANDERSON. 1961. *USDA Farmers' Bul.* 2035. 29 pp., illus.

Wild Ducks on Farmland in the South. By WILLIAM W. NEELY AND VERNE E. DAVISON. 1966. *USDA Farmers' Bul.* 2218. 16 pp., illus.

More Wildlife Through Soil and Water Conservation. By WALLACE L. ANDERSON AND LAWRENCE V. COMPTON. 1963. *USDA Inf. Bul.* 175. 16 pp., illus.

Soil Conservation Tips for Sportsmen. By PHILIP F. ALLAN AND FELIX SUMMERS. 1959. *USDA PA* 400. 4 pp., illus.

How to Plan a Shooting Field in the Northeast and Corn Belt. By PHILIP F. ALLAN, OLAN W. DILLON, JR., AND H. GRANVILLE SMITH. 1964. *USDA Leaflet* 532. 8 pp., illus.

Autumn Olive for Wildlife and Other Conservation Uses. By PHILIP F. ALLAN AND WILMER W. STEINER. 1965. *USDA Leaflet* 458. 8 pp., illus.

Russian-Olive for Wildlife and Other Conservation Uses. By A. E. BORELL. 1962. *USDA Leaflet* 517. 8 pp., illus.

Wild Turkeys on Southeastern Farms and Woodlands. By DALE H. ARNER AND VERNE E. DAVISON. 1963. *USDA Leaflet* 526. 8 pp., illus.

Warm Water Ponds for Fishing. By W. W. NEELY, VERNE E. DAVISON AND LAWRENCE V. COMPTON. 1965. *USDA Farmers' Bul.* 2210. 16 p., illus.

Lespedezas for Quail and Good Land Use. By VERNE E. DAVISON. 1960. *USDA Leaflet* 373. 8 pp., illus.

Trout in Farm and Ranch Ponds. By ADREY E. BORELL AND PAUL M. SCHEFFER. 1961. *USDA Farmers' Bul.* 2154. 18 pp., illus.

Waterweed Control on Farms and Ranches. By VERNE E. DAVISON, JOHN M. LAWRENCE AND LAWRENCE V. COMPTON. 1962. *USDA Farmers' Bul.* 2181. 22 pp., illus.

From the Administrator:

- *Model in the Potomac*
- *Cooperation for Wildlife*



WATERSHED treatment of the kind advocated by the Soil Conservation Service makes up a substantial part of the emerging plan to make the Potomac River Basin a "model" of conservation.

This is evident in the progress report recently submitted to the President by the Secretary of the Interior in response to the charge contained in the White House Message on Natural Beauty. The preliminary plan gives reassuring prominence to land treatment and upstream water-control structures as a basis for safeguarding the natural resources of the area.

While the President's emphasis was on "scenic and recreational values," the Interdepartmental Task Force designated to prepare a plan of action wisely recognized that the river and its environs could not be made or kept a satisfying habitation for people without correcting the cancerous effects of erosion and sedimentation.

The interim report sketches the broad outlines of the comprehensive plan as evolved in the first year's study. While many problems need further investigation, some of the basin's conservation needs are plainly evident and call for prompt action. On these, the preliminary report recommends immediate action.

Among the most important of the initial proposals are (1) the expansion and acceleration of land use adjustments and soil and water conservation treatments on private land, and (2) the prompt installation of upstream watershed reservoirs at suitable sites within the National Forests of the basin and their development for recreational use.

These activities can proceed under existing authorities of the Department of Agriculture as soon as funds are made available. Moreover, they provide logically for the installation of needed measures starting at the top of the watershed and working down.

It is also recommended that action be taken to extend the existing authority for upstream watershed improvements under the Flood Control Act of 1944 to the entire basin.

The basic conservation treatment of the uplands of the entire basin and protection of its watercourses will lay a solid foundation for the extensive system of parks and recreation areas, scenic and natural preserves, hiking and auto trails, and wild rivers and lakes envisioned for the enjoyment of people living in and visiting the Potomac basin.

As taking shape in the preliminary report, the plan promises to make the historic river that embraces the Nation's capital a worthy model of river basin planning and development.

Even before the plan becomes reality on the land, it can serve as a model in another way—in the participation and cooperation of the various agencies concerned with land and water resources at both Federal and local levels.

Top-level administrators and technicians learned firsthand from this experience what USDA and SCS watershed planning parties in the field have long recognized—that any watershed or river basin is a complex combination of resources, all important in different ways to different people, so that a satisfactory plan can be achieved

only by the joint participation of all concerned.

The fair representation of all resource interests and levels of Government on the Interdepartmental Task Force and the cooperative spirit that characterized their work already stands as a model for river basin planning everywhere.

ANOTHER EXAMPLE of cooperation in resource planning is gaining strength in the joint committee set up by the Department of the Interior and Department of Agriculture to review and resolve problems concerning wildlife in small watershed projects.

The small watershed program has enormous opportunities for constructive wildlife improvements. In many watersheds in many States, these opportunities have been seized by the local sponsoring groups, including fish and wildlife agencies.

But sometimes, because of lack of information or due to misunderstanding, the fish and wildlife potentials have not always been realized. Conflicts of opinion regarding land use occasionally hampered the full realization of opportunities for habitat improvement.

The committee, made up of representatives of the Fish and Wildlife Service and the Soil Conservation Service, already is demonstrating that most differences can be resolved—or at least offset by constructive action—when the interests concerned review the facts impartially and seek practical measures to accomplish mutual goals.

The recent appointment by the Secretary of Agriculture of a Wildlife Advisory Board to make recommendations on programs and policies affecting wildlife of the Cropland Adjustment Program is further evidence of the consideration being given all resources in the Department's land use programs.

D. A. WILLIAMS



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Boiling Down the Maple Sap

Story on page 187



Ralph Grosvenor prepares to empty a tank of maple sap into storage tanks at the sugar house on his farm in Geauga County, Ohio. Steam rises from the sugar

house where the sap is boiling down.

When the sap is running, the Grosvenors may have all their meals at the sugar house, which is equipped with a fold-away table,

chairs, and an icebox cupboard.

Grosvenor used lumber from his woodland to build the sugar house and a lean-to shelter for the team of horses. ♦

SOIL Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

~~Beichner~~
~~Hagen~~
~~Ahlstrom~~
~~Dalke~~

SOIL CONSERVATION IN MANY LANDS

Brazil—Nicaragua—Chile

Pages 196, 197, 207

Croplands

Pages 210, 216

Grass Farming

Pages 198, 200, 204





Pan American . . .

Soil conservation gains as an international profession with the convening of the First Pan American Soil Conservation Congress (p. 209).

The exchange through the years of ideas and experiences by SCS conservationists and their counterparts in other lands has built a mutual interest among people and a body of knowledge about resources that transcends national boundaries.

Joao Abramides Neto as general coordinator of the Congress in Brazil and SCS's Roy Hockensmith in the United States give form to this development in the program they have arranged at Sao Paulo.

Action: Through Fred Prange, assistant to the administrator for foreign operations, we obtained firsthand accounts of our two action projects in the Americas: From Dirk van de Voet in Brazil (p. 196) and Gerald M. Darby in Nicaragua (p. 197).

These efforts illustrate the kind of technical service SCS offers other governments through arrangements Prange explains in his opening article (p. 195).

Grass: While conservation in many countries concentrates on cropland to bolster desperately needed food production, current emphasis in the U.S. is on extending grassland agriculture.

Significant grass-growing experiences are reported from Oklahoma by SCS Agronomist Maurice Gamble (p. 198) and from Indiana by Prof. Maurice Heath (p. 200).

COVER: A Puerto Rican farmer and an SCS conservationist together survey their joint handiwork, a pond nestled safely between contoured slopes.

Soil Conservation

Devoted to the wise use of land and water resources

APRIL 1966

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A black and white photograph of a tall palm tree in a nursery. The tree is the central focus, with its trunk extending from the bottom left towards the top center. At its base, there are several smaller trees and bushes. The background shows a clear sky and some distant trees.

Foreign Aid in Soil Conservation

By Frederick A. Prange

Assistant to the Administrator, SCS

THE full technical resources of the Soil Conservation Service are made available to advance soil conservation and resource development outside the United States under a new type of international aid agreement now in effect with five countries.

Under the plan, the Soil Conservation Service provides technical assistance to specific projects in much the same way that it does to soil conservation districts or small watershed projects in the United States.

SCS assigns technical personnel to each project according to needs as the work progresses. The assigned personnel have the full technical and administrative support of the Soil Conservation Service while in the participating countries the same as when helping land owners and users at home.

The Participating Agency Service Agreements are three-way arrangements between (1) the Soil Conservation Service and International Agricultural Development Service (IADS), U. S. Department of Agriculture, (2) U. S. Agency for International Development (AID), and (3) the participating country. SCS personnel usually are members of a team of experts from several agencies, universities,

or other organizations.

SCS has such agreements for projects in Brazil, Nicaragua, Nigeria, Tunisia, and Thailand. The assistance is a part of the United States' aid program for developing countries. It is intended to help keep food production in balance with increasing population by improved husbandry of farmlands.

Food and people

The Food and Agriculture Organization of the United Nations has proposed that world food production be increased by 4 percent a year for the next 15 years. FAO states that such increases are necessary to improve the diet of a half billion people suffering from malnutrition and a billion others who are underfed. The farmlands of the world must provide for an additional 60 million mouths each year. Latin America shares heavily in this unbalance between food and people.

The Soil Conservation Service has been providing technical training and conservation information to developing countries for more than 25 years. By training of specialists and students who come to the United States to learn new methods, SCS has provided a nucleus of trained people for conservation activities in other countries. In addition professional people have gone to other countries and helped in analyzing soil and water

Apricot seedlings grow at the base of a palm tree in a plant nursery established with SCS assistance at Al Asnam as a part of the conservation program in Nigeria.

(Continued on p. 206)

Frontier Survey Seeks New Areas for Settlement in Brazil

by Dirk van der Voet

Soil Scientist, SCS, on foreign assignment, Rio de Janeiro, Brazil

THE Soil Conservation Service now has two soil scientists in Brazil participating in the Frontier Resources Survey Project of that country under an agreement with the International Agricultural Development Service (IADS), and the Agency for International Development (AID). Others have spent short periods on the project, and still others are expected to participate later.

The basic purpose of the Frontier Resources Survey Project is to determine the extent and location of relatively unsettled land areas in Brazil which could provide land resources and economic opportunity for several million people from areas of excess population.

An exploratory soil survey map and general report are being made for the western two-thirds of Brazil. Based on this, broad areas can be indicated as generally suitable for settlement. To further confirm and more accurately identify land

suitable for settlement, "reconnaissance surveys" will be carried out to delineate areas totaling 50 to 75 million acres.

The Soil Conservation Service is supporting the project under a Participating Agency Service Agreement with AID, the International Agricultural Development Service of USDA, and the government of Brazil.

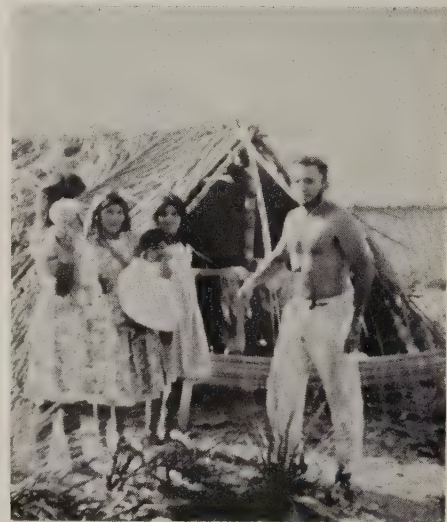
In the fall of 1963 and summer of 1964 Roy Hockensmith, director of soil survey operations, SCS, made trips to Brazil to lay the groundwork for the project.

Dr. Guy Smith, director of soil survey investigations, SCS, spent several weeks in 1964 in Brazil working on soil classification.

The two soil scientists now in Brazil are on 2-year assignments working full time on the project. Francis W. Cleveland, formerly assistant State soil scientist for Illinois, is assisting with soil interpretations. The author, formerly assistant State soil scientist for New



Francis W. Cleveland, SCS (l., above), and other soil scientists study exposed soil profile along roadbank in western Sao Paulo. Italo Falesi, Brazilian soil scientist (below) pauses for a visit with an Indian family in western Brazil.



The soils expedition refuels at a construction camp of the National Department of Highways along the only road through the tropical rain forest to western Brazil.



Hampshire, is assisting in aerial photo interpretation. In addition they are giving overall assistance in the planning and operations of the project.

The project agreement calls for additional support visits of 1 to 3 months' duration from soil scientists of the Washington staff.

A. C. Orvedal, chief, world soil geography unit, SCS, was in Brazil for 2 months in 1965. He gave advice and assistance in the preparation of a legend for the exploratory map and guidelines for developing the first approximation of the exploratory map.

(Continued on p. 206)



Nicaragua Improves Its Livestock Industry With SCS Technical Aid

By Gerald M. Darby

Agronomist, SCS, on foreign assignment, Managua, Nicaragua

IMPROVED PASTURE development and management combined with better selection and culling of animals are moving the Nicaraguan livestock industry on its way toward the country's goal of adequate beef and dairy products for its growing population.

The United States is helping through a Participating Agency Service Agreement between the Soil Conservation Service and International Agricultural Development Service of USDA, the Agency for International Development, and the Nicaraguan government. Under this agreement SCS provides the services of a specialist in pasture and forage management. That is my assignment in Nicaragua.

Nicaragua depends on cotton, coffee, livestock products, and sugar exports (in that order) for a large share of its foreign exchange earnings. Unstable world prices for coffee and cotton have caused annual earnings to fluctuate widely. It is hoped that an expanded livestock industry will help stabilize the economy.

An important part of the program is to provide adequate forage throughout the year. This is difficult because Nicaragua has a 4- to 6-months' dry period, roughly

December through May, when pastures make little growth. The problem is critical in western Nicaragua where people and livestock are concentrated.

Forage production can be increased by establishing more pastures of high-producing grasses and practicing proper grazing, better weed and brush control, rotation of grazing, proper distribution of adequate water facilities, fertilizing, and elimination of pasture burning. Once sufficient forage is produced for a year-long supply, it can be held for winter use as silage, hay, or dry pasture.

The AID program is providing training in pasture management for agricultural technicians of the Ministry of Agriculture, the National Bank, the Agrarian Reform Institute, and the National Development Institute of Nicaragua. It also is helping with livestock and pasture management demonstrations.

The Agency for International Development and the International Development Bank have provided more than \$10 million of credit for the program. The money is re-

Mario Latino and Ernesto Ruiz look over a plot of Napiergrass located at La Calera Research Station, Managua, Nicaragua.

Checking out native legumes for trial and seed increase is part of the job for SCS Agronomist Gerald Darby (l.) shown with Mario Latino, kneeling, and Ernesto Ruiz of the Nicaragua Ministry of Agriculture. They are inspecting a properly grazed African stargrass pasture.

loaned through regular banking agencies to farmers and ranchers for establishing pasture, developing water supplies, building silos, and fencing for rotation of grazing.

Improved cattle breeds have been imported and an active program of artificial insemination is underway.

Grasses which are doing well in one part of Nicaragua are being established in other sections of the country for trial and propagation.

The La Calera Research Station of Nicaragua is being assisted with collection of native legume seed and with pasture fertilizer trials.

As a part of the total national program, farmers and ranchers are being informed of the harmful effects of fire on pastures, croplands, and forests.

In this way, Nicaragua is laying a foundation for an expanded livestock industry. ♦



Bermudagrass in Oklahoma

A lowly pasture grass rises to key role in conservation agriculture of the South

By M. D. Gamble

Conservation Agronomist, SCS, Stillwater, Okla.

ALOWLY creeping grass, once feared as a pest, has won its way in half a century to a position as a major crop in conservation farming systems in Oklahoma.

Bermudagrass is now welcomed and grown successfully on farms in every part of the State, except in the High Plains. The history of bermudagrass in Oklahoma mirrors the evolution of grassland agriculture in a region once dependent on row crops.

The present widespread use of bermudagrass in Oklahoma stems from a small planting from seed at the Oklahoma Agricultural Experiment Station in 1892. The few plants that survived that winter were called "hardy" bermudagrass.

Trial in every county

John Fields, director of the station, in 1902 began a long crusade for recognition and use of bermudagrass in Oklahoma. During the years 1904 and 1905 he supplied at least one farmer in each of Oklahoma's 77 counties with

enough rootstocks for a trial planting. By 1907 bermudagrass had made its appearance in every county in the State, including the Panhandle counties with their higher elevations and semiarid climate.

Farmers who made these trials were generally well pleased but some were fearful that the vigorous grass would overrun their entire farms, which at that time were mostly in row crops.

During this period of introduction, the State was favored by above-normal rainfall, except the years 1909 to 1911, when dry summers and cold winters eliminated bermudagrass from the Panhandle and most of western Oklahoma.

From these early plantings bermudagrass thrived throughout the eastern half of Oklahoma. It is reported that in 1910 Lincoln County, in central Oklahoma, soded 798 acres, bringing its total acreage to 1,372. Today bermudagrass pastures in the Lincoln County Soil and Water Conservation District exceed 40,000 acres.



This bermudagrass waterway planted in 1938 is still carrying water from 80 acres on a farm in the Stephens County Soil Conservation District, Okla.

Bermudagrass is now being planted in the State at the rate of more than 190,000 acres annually. Presently, more than 2½ million acres control erosion and furnish valuable forage for Oklahoma's expanding livestock industry. It has been predicted that the acreage will reach about 5 million.

There are many ways of planting bermudagrass rootstocks. In the early days planting was done by hand. The sprigs or sod chunks were dropped a few feet apart in furrows and covered by using any suitable farm equipment that was available.

The widespread planting of bermudagrass was made practical by the invention of mechanical planters to place the rootstocks in the soil and cover them. One of the first (l.) was a horse-drawn outfit that required a second operator to drop the sprigs through a chute. A modern planter mounted on a tractor (r.) requires only one operator.





Bermudagrass is a major grass in both permanent and rotation pastures in Oklahoma. Midland bermudagrass and clover (l.) make productive pasture on cleared bottom land in the Johnson County SCD. Corn planted in a bermuda sod (r.) produced a bumper crop in the Gaines Creek District.

In 1910 one farmer reported that he planted his bermudagrass while driving a wagon across a prepared seedbed dropping the sprigs in the ruts made by the front wheels and pressing them into the ground with the rear wheels.

These methods, although effective, were too slow to be practical for large scale plantings and farmers started using manure spreaders to scatter the roots on a prepared seedbed to be cut in with a disk and cultipacked. It was not uncommon to interplant the grass with corn, and it was found that cultivation aided growth.

The Emergency Conservation Work in the early thirties brought widespread establishment of bermudagrass for pasture and erosion control in Oklahoma.

Automatic planter

Many innovations were devised to speed up the planting. All were more or less effective, but it was not until 1949 that an automatic bermudagrass planter designed by the Soil Conservation Service was placed in commercial production. Today a number of companies are manufacturing planting equipment that is shipped to all parts of the country where bermudagrass is grown. Although made primarily for field plantings, this equipment is suitable for planting bermuda-

grass on watershed structures and on highway cuts and fills.

Highway officials in recent years have given increased attention to the establishment and maintenance of a protective cover of bermudagrass on highway shoulders and cuts. On the 88-mile Will Rogers Turnpike in northeastern Oklahoma, for example, about 1,850 acres of bermudagrass was established and is being maintained for roadside stabilization and beautification.

The soil-conserving ability of bermudagrass has been proved by many years of research. At the Agricultural Research Service Hydraulic Laboratory at Stillwater,

Okla., bermudagrass was outstanding as vegetation for protection of waterways, being able to withstand a velocity of 8 feet per second on 10 percent slopes.

Today many thousand bermudagrass waterways are safely channeling excess water from terraced fields. It is also used to stabilize dams and spillways on thousands of farm ponds and hundreds of floodwater detention structures.

Since the advent in 1950 of equipment for seeding into sod, bermudagrass pastures in eastern Oklahoma are being overplanted with cool season small grains and legumes to furnish additional grazing. The residual effects of fertil-

A heavy tractor on the level berm of a floodwater-retarding structure steadies a bermudagrass planter on the steep slope below by means of a cable connecting the two pieces of equipment.



izer and legumes increase the quality and quantity of the succeeding years' yield of grass.

Today there are a number of improved varieties of bermudagrass being planted in Oklahoma. Coastal bermudagrass, a development of the Georgia Coastal Plains Experiment Station, is the predominant variety in the southeastern part of the State, where it is well adapted to the forested coastal plains soils.

Another variety developed from a first generation hybrid of Coastal bermudagrass, and a hardy Indiana strain was brought to Oklahoma in 1949 for testing. This variety was found to be more tolerant of cold and drought than Coastal bermudagrass and was released cooperatively by the Oklahoma Agricultural Experiment Station and Georgia Coastal Plains Experiment Station, as Midland bermudagrass. It is well adapted to Oklahoma conditions, and most of the acreage now being planted is of this variety.

In 1954 the Oklahoma Experiment Station released rootstocks of a new variety of common bermudagrass named Greenfield in honor of John Fields, an early director of the station. Many farmers and livestockmen like Greenfield, and sizeable acreages of this variety also are being planted.

Once it was thought that bermudagrass was adapted only to the higher rainfall areas of eastern Oklahoma, but now it is being widely planted in drier sections on adapted soils where there is a favorable soil-moisture relationship. Bermudagrass is also being used in irrigated pastures on many farms.

General and widespread acceptance of bermudagrass attests to its value as a conservation crop of high value for forage production and for soil protection and improvement. Today many farmers are using bermudagrass as a major crop in a conservation cropping system. ♦

Indiana Forage Farm

Pasture research seeks profitable farming system for livestock-woodland area

By Maurice E. Heath

Associate Professor of Agronomy, Purdue University, Lafayette, Ind.

RESearch on soil and climatic problems of the unglaciated sandstone-shale region of southern Indiana is opening the way to a more profitable use of land in the area. As the studies bring to light crop adaptations and improved cultural practices, new and superior alternatives with less risk become available.

The research studies started in 1949, when an interdepartmental committee at Purdue University's Agricultural Experiment Station was asked to study how some of the low-income areas of southern Indiana could be made more profitable. The sandstone-shale soil region was chosen because it was considered to have one of the lowest per-acre incomes.

In 1952 farmers and industries from the 41 southern Indiana counties raised funds to purchase 11 farms comprising 1,016 acres in northeast Dubois County, at an average cost of \$40 an acre. In 1953 the land was given to Purdue University for research purposes and became known as the Southern Indiana Forage Farm.

Type of land

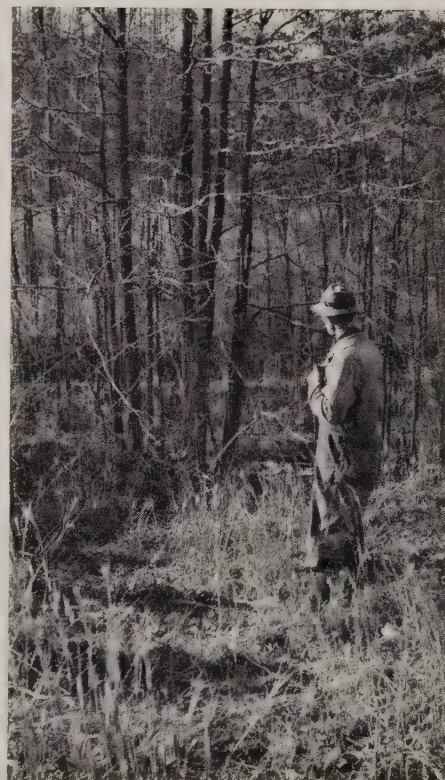
The region is deeply cut with drainageways. The topography is rolling to steeply rolling. A thin mantle of loess ranging from a few inches to as much as several feet thick covers the area. Without protective vegetative cover the soils erode very easily.

Impervious soil layers that re-

strict water infiltration are common and limit root zones to 30 inches or less in many areas. Forty percent of the land is too steep for the use of farm equipment and



Scrub woods covered about 40 percent of the Forage Farm when it was purchased.



Photos were taken by the Indiana Agricultural Experiment Station, Lafayette, Ind.

is in woodland. Initial soil tests showed available phosphorus and nitrogen to be very low but available potassium to be in fair supply.

The major part of the Forage Farm is in land capability classes II, IV, and VII with more than half the acreage in classes IV and VII.

Southern Indiana receives 40 to 46 inches of rainfall annually, with more than a month of summer drought to be expected 8 years out of 10. Winter temperatures fluctuate frequently above and below freezing with little, if any, snow cover. Soils are commonly waterlogged in winter and extremely dry during summer droughts.

Research objectives

The purpose on the Forage Farm is to study how to intensify a forage-livestock-woodland type of agriculture. The research deals with problems of forage establishment and production; measurement of animal response from forages that can best be grown; woodland management; development of adequate supplies of potable water for home and grade-A dairy use; irrigation potentials; and other resource problems such as alternative uses of land and water for recreation, wildlife, and fish production. The research deals only with problems peculiar to the area.

Production problems

The first 4 years were a period of intense land and facility development. Hillside gullies were sloped, scrub and small trees cleared, soil treatments and forage seedings made. Pasture fields and woodland areas were fenced. Sixteen farm ponds were built to provide water for livestock in pasture fields and facilities for water and fish research.

Based on previous limited small plot trials in southern Indiana, alfalfa was chosen as the base legume.

Fifty acres were seeded to a 50-50 alfalfa-grass mixture in 1956.



Cattle graze in winter on aftermath and round bales of tall fescue on field cleared of woods after the Forage Farm was purchased.

It was soon found that, with soils waterlogged in winter, alfalfa suffered excessively from heaving from frost, especially if grazed. In 1958, following the first year of grazing, 98 percent of the alfalfa had disappeared. Alfalfa stands for hay continue to thin from heaving and usually need

reseeding after the third harvest year.

Year-round pasture

Five years of research with beef cows and calves showed that stock over-wintered outdoors performed as well or better than that having shelter. These results suggested

Field days and tours on the Forage Farm give specialists an opportunity to explain the potentialities of community development in the area.



the practicality of an all-winter pasture program for beef cows in the area.

Excellent winter pasture results were obtained with tall fescue. After seed harvest in June, the hay is cut and dropped in round bales in the field. Aftermath and bales are then available for winter grazing. Rationing winter pasture with an electric fence to give stock access at one time to what they will clean up in a month has increased the days of grazing 57 percent over free-choice grazing.

Reed canarygrass on low land subject to flooding has shown promise for midsummer drought pasture.

Water from farm ponds

Drilled wells on upland farms in the sandstone-shale soil region are usually of very low yield. Farm ponds however hold water well if properly located. Pond water at the forage farm has provided an abundant and dependable supply of potable water where a slow sand or diatomaceous earth-type filter is used with chlorination.

Low-risk crops

Research and development on the forage farm have shown what low-risk crop and culture alternatives are available to the hill farmers of the area. Winter wheat proved to be extremely low risk. Winter vetch, if used for silage can also be grown with the wheat. The new hybrid grain and forage sorghums grown in close 14-inch noncultivated rows tolerate drought stress and qualify as low-risk crops.

Of the perennial grasses tested, tall fescue is unequalled for sod density and ground cover at all levels of fertility. Preliminary results with some of the lateral rooted perennial legumes strongly indicate that they may have a tolerance to heaving that would make their use practical.

Effort is also underway to find new industrial cash crops that will fit the environment of the area. ♦

Conservation Practices Mark Indian Lands Across Oklahoma

By Edward J. Anderson

Area Land Operations Officer, U. S. Bureau of Indian Affairs, Anadarko, Okla.

CONSERVATION measures and good management practices on the land are showing up over wide areas of Oklahoma, and some of the better programs of stripcropping, cover crops, and grass rotation are evident on land in Indian ownership.

In fact, stripcropping on broad fields subject to wind erosion is a distinctive mark of conservation on Indian land. In the peanut producing areas of Oklahoma stripcropping is a required practice.

Widespread, too, is legume rotation which makes for more prosperous and attractive farm units.

Indian reservations were set aside by treaty for use of all members of a tribe occupying the reserved land. In some cases definite tracts were allotted to an individual. Indians still own more than a million acres in Oklahoma and

have use of 73,000 additional acres owned by the Federal Government.

Though all these lands are private, they are held in trust by the Federal Government with large acreages operated under lease contracts with individual farmers. Conservation and proper land use are a part of the trust responsibility, for the land represents the Indian citizen's greatest physical resource. Conservation plans are part of the land use contracts



Arlo Trull, lessee, (above, c.), shows Indian landowners the growth of peanuts made possible with irrigation. Frank Tabbyite, Sr. (below, c.) and son (l.) with neighbor Robert Toquothy fill hopper to make a planting of Midland bermudagrass.





An interpreter assists a technician with training aids in educational meeting for Indian landowners.

assuring continuous conservation practices.

The Branch of Land Operations of the Bureau of Indian Affairs has program responsibility for conservation, including soil and moisture conservation operations on agricultural lands, irrigation operations on western reservations where irrigation is practiced, agricultural extension, and outdoor recreation, including fish and wildlife.

Conservation examples

A good example of conservation-minded Indian landowners is the Frank Tabbytite family, Comanches of Walters, Okla.

Mr. Tabbytite, his wife, and son, Frank, Jr., operate 560 acres of restricted Indian land. In 1957 Tabbytite started a complete conservation program on all the land. He has increased his income on the acreage by 50 percent.

An important part of the Tabbytite operation is the effective use of improved and temporary pastures. In many areas Indian farms stand out as examples of good grassland management.

Irrigation development is another measure that has meant increased income to Indian landowners in southwestern Oklahoma.

Mrs. Thelma Warden Standing

and her sister Mrs. Lorene Warden Ross, members of the Wichita Tribe, leased their 320-acre farm to Mr. Arlo Trull through the Bureau of Indian Affairs near Fort Cobb.

Through an irrigation program, crop-share rental to the Indian owners has averaged \$6,000 a year. This is approximately six times the average dryland rent of \$1,115 previously received on this land.

Irrigation has meant better cash crops, and the growth of cover crops is assured, lessening the hazards of wind erosion in an area of predominantly sandy soils.

In Oklahoma it is required that

all Indian acreage grow winter legume crops a minimum of 1 year in 5. Rangelands are used on the basis of management plans consistent with soil and range surveys that recommend patterns of use according to range site and conditions.

Educational meetings are held frequently to inform Indian landowners of conservation farming techniques and to encourage better land use.

Conservation education and the Indians' appreciation for the land combine to make many Indian farms in Oklahoma models of good management practices. ♦

Weeping lovegrass in crop rotation gives protection from wind erosion and helps improve soil.



Six Steps to Good Pastures

By B. D. Blakely

Head Conservation Agronomist, SCS

FITTING a year-round forage program to livestock needs is not an easy task on many livestock farms. Yet it is an essential ingredient of conservation planning, for economic forage production is often the key to the total conservation program on livestock farms.

On many soils, especially those that are steep or shallow, a dense sod of pasture grasses makes the best defense against soil erosion and excessive runoff. On these, as on many acres of better arable land, livestock production offers an attractive alternative use.

An economic livestock enterprise requires a sustained high level of forage production that provides ample feed through the year. The six steps to good pastures pictured here help make that possible.

1. Adapted plants. Plants that are well adapted to the soil and climate will stay productive longer than species poorly suited to soil conditions. There are many kinds of grasses and legumes that can be used for grazing. Several have special characteristics that make them desirable for certain soil and climatic conditions, such as the pangolagrass and white clover combination used with seepage irrigation (below).

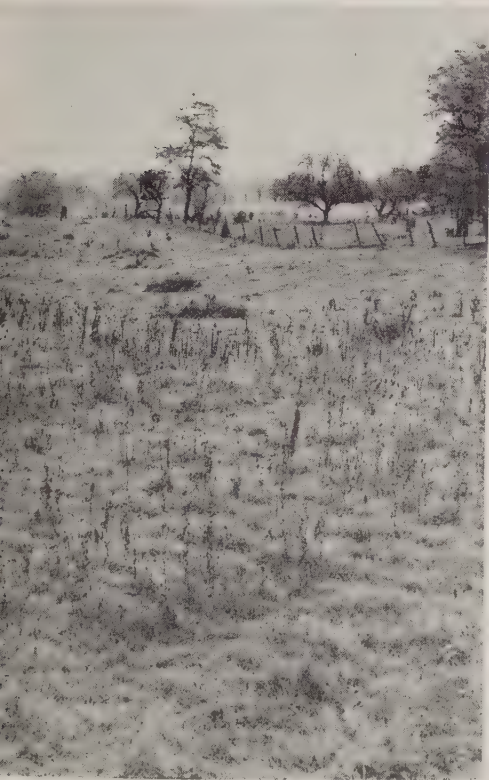
2. Fertilizer. Like any other crop, pastures need fertilizers to keep them productive. Have the soil tested to determine the fertility needs at time of seeding. Then maintain vigor and growth by applying fertilizer, especially nitrogen, as needed each year. Applying ground limestone (below) is often the first step in developing an improved pasture in humid areas.





3. Grazing management. Proper grazing prolongs the life of the pasture and increases milk and meat production. The growth habits of the different plants determine when and how much to graze. Allow a period for regrowth each year. Even such a vigorous grass as bermudagrass (above) can be overgrazed.

4. Weed control. Weeds (below) use water and fertilizer that otherwise could be used by pasture plants. Clip or otherwise control them before they go to seed.



5. Renovation. Profitable pastures begin with good stands. Old, thin pastures need to be reseeded to provide an abundance of quality forage. Have a good seedbed, apply fertilizer, and protect from grazing until the stand is established.

6. Year-round forage. Plan for enough of the right kinds of pastures to provide enough forage for all seasons, plus some extra. Supplemental annual pastures, such as the sudan below, often can fill gaps when other pastures are not providing enough feed. ♦



Foreign Aid

(continued from p. 195)

problems and planning conservation programs.

Among other items, the programs provide for (1) using land within its capabilities, (2) improving crop and forest management, (3) handling water to protect the land and to irrigate crops, and (4) other applicable soil and water management practices.

Countries from all over the world are showing greater interest in using their natural resources more wisely. Many of them have already taken steps to use their soil and water resources in keeping with the future food and fiber needs of their people.

Demand for technology

Because of the increased demand by developing countries for agricultural technology, the U. S. Department of Agriculture has recently established an agency to provide this type of assistance. The International Agricultural Development Service works through AID in coordinating technical assistance agreements and in arranging for technicians to service them. The Soil Conservation Service currently is providing technicians for the following projects:

Brazil—Two soil scientists are working with a team in the Brazilian Government's Frontier Resources Survey Project. The soil scientists are assisting their counterparts in improving map interpretation and reconnaissance soil mapping of large undeveloped areas.

Nicaragua—One SCS agronomist is a member of a USDA team working with Nicaraguan technicians to improve the country's agricultural production with emphasis on grassland improvement and beef production.

Nigeria—Four soil conservationists are training Nigerians for leadership in a government soil

and water conservation program for northern Nigeria. The Nigerian agriculturists are receiving training in technical subjects of soils, engineering, agronomy, and forestry, and in the supervision and administration of a resource conservation program.

Tunisia—Seven SCS technicians are working in the development of the Oued Marguerril watershed. A watershed plan was completed in 1963. Conservation practices and structural works of improvement were started in 1964. The technicians are assisting in detailed planning and application work on the land. At the same time they are training Tunisian technicians so they can assume direction of the program.

Thailand—Four SCS technicians are working with the Land Development Division of the Thai government. They will train a number of Thai technicians in methods and techniques of working with land owners and operators for establishing conservation practices and improving agricultural production. ♦

BLM Stock Pond

The unusual stock pond pictured on the back page of the December *Soil Conservation* was built on public land administered by the Bureau of Land Management, a fact not mentioned in the article.

The Buckhorn Cattle Association of Utah uses the allotment under permit. The association and BLM shared the costs of the project on a 50-50 basis. ♦



Frontier Survey

(continued from p. 196)

As part of the exploratory survey, field parties have been operating in the States of Acre, Goiás, Maranhao, Mato Grosso, Pará, and Piaui, and the Territory of Rondonia.

A Brazilian soil scientist from the Division of Soils and Soil Fertility of the Ministry of Agriculture is working with the author on aerial photo interpretation. The project has procured most of the aerial photo mosaic indices of Brazil that are available. These have been used in the preparation of the exploratory map. The procurement of individual photos is being delayed until areas are designated for reconnaissance survey. A basic training of 7 days' duration in aerial photo interpretation has been given to 42 soil scientist trainees of the project.

Soil interpretation has produced a capability classification system based on six systems of management, ranging from the primitive use of the hoe and machete to use of modern machinery and advanced methods of cultivation and fertilization.

The use of fertilizer in Brazil is made difficult by the great distances from the sources of supply and inadequacy of transportation facilities. It is essential, therefore, that encouragement be given to settlement of the areas with most natural fertility.

Attempts are being made to interpret soil maps according to their potential for the more primitive as well as with advanced types of agriculture. Interpretative tables are being prepared to accompany the exploratory map, listing the dominant soils occurring within the mapping units. These tables list the main limitations and hazards affecting land use and will classify the dominant soils according to their potential under different management systems. ♦

Trees and Cover Crops Bring New Life to Soils of Fundo Chequen

By Carlos Crovetto Lamarca

As told to Fred W. Herbert, formerly Assistant State Conservationist, SCS, Berkeley, Calif.

OUR RANCH in Chile, operated by my father Tomas Crovetto, my brother, Tomas, Jr., and myself, contains 1,500 acres, about 25 miles from the City of Concepcion.

My father purchased this property in 1945. He was a city-bred man but had a strong love for the land, inherited from his father who was a farmer in Italy. He wanted his sons to take up a farming life.

200 years of wheat

The use of the acreage of our farm, "Fundo Chequen," at this time is about as follows: 1,000 acres in "dryland," 100 acres of irrigated pasture, 80 acres in vineyard, 10 acres in orchard (cherries and apples), and 300 acres in pasture and forage. In addition we raise about 5,000 chickens annually. "Dryland" is a term we use for land that cannot be cultivated to any advantage.

On all this land, excepting the vineyard, nothing but wheat had

Carlos Crovetto made his first trip to the United States in June 1958 for the purpose of learning about soil and water conservation. Under the auspices of the Soil Conservation Service, he visited areas in Washington, Oregon, and California, to observe and study land management methods.

He returned to Chile in February 1959 and immediately began to put soil and water conservation practices into effect on land that sorely needed rehabilitation. In 1963, he made a second 12-weeks' trip to this country. On this trip he related this account of his farming, the results of his conservation activities, and his expectations for the future.

He was assisted with his itinerary and contacts in this country by the Agency for International Development and the Soil Conservation Service, but he paid all his expenses on both trips.—F.W.H.

been raised for 200 years. The soil was badly eroded and the fertility very low. Production was at a minimum. Wheat yields were as low as four times the amount of seed planted.

Similar land in the neighborhood has already gone from cattle to sheep. The next step will be goats and then abandonment. This was the situation we were faced with, and we realized that unless something was done, our land was doomed.

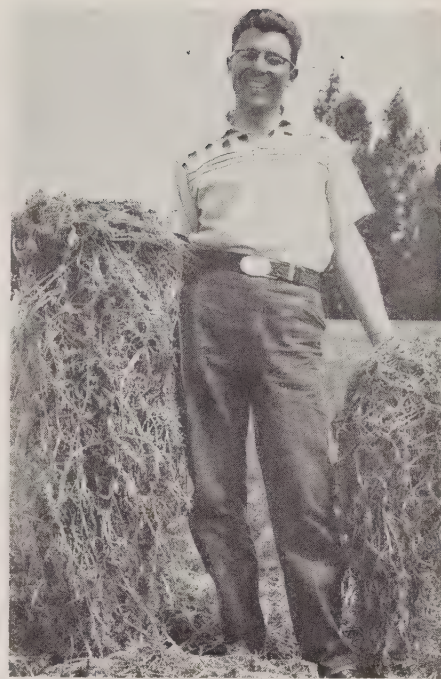
My father's first project was to put the thousand acres of dryland into trees. He had a natural "land sense" and recognized that trees represented the only long-term, satisfactory use for this part of the farm. It was class VI and VII land, uneven, with steep slopes in some places, gullied, and most of the topsoil had eroded. The soil that was left is a heavy-textured clay loam. Much of this land was a menace to the tillable acres below.

Monterey pine was selected as the woodland tree because of its proved adaptation to that area. The climate is comparable to that of the coastal valleys of California, such as Napa and Sonoma. The trees were obtained from a government nursery.

First harvest in 10 years

My father spent 2 years, 1946-47, planting these trees himself, by hand, with a small amount of hired labor. The trees were planted 7 feet apart both ways, about 1,000 trees an acre—a million trees in all.

By 1963 the trees were about 17 inches in diameter breast-high and



The author shows the luxuriant growth of Lana vetch on his farm.

50 to 70 feet tall. The plantation has been regularly pruned and thinned. The first thinning was made in about 40 percent of the plantation when it was 10 years old. A second thinning was made several years later.

The thinnings were sold to a pulp mill at Concepcion, and this just about paid for the labor. We also used the wood for charcoal and heating. We ended up with about 300 trees an acre.

We have a small sawmill on the farm, and I have built an 8-room home for myself and seven small homes for workers, all with lumber from our trees. We will begin harvesting timber in about 1968 and will continue to manage the plantation on a sustained yield basis.

Our first step to improve the tillable land was to plant crimson clover. We planted 20 acres in 1955, to be rotated with winter wheat.

The crimson clover was the first legume in the dryland area. It provided excellent grazing, and the yields of wheat began to improve. These steps were an encourage-



A 10-year-old vineyard on a 25 percent slope in the fourth year of nontillage, using blue lupine as a green manure-mulch cover crop. The vines are planted 3 feet apart. Monterey pines are planted in the background. In the picture (l. to r.) are Tomas Crovetto, Jr.; Gustavo Arancibia, soil conservation specialist; and Carlos Crovetto.

ment to go further and led to my desire to learn all I could about modern methods of erosion control and the use of plants for soil conservation for the rest of our farm.

Mulch and nontillage

On my first trip to the United States, I was chiefly concerned to learn how to stop soil erosion. This was our immediate and vital need. I was alert to soil conservation measures and particularly any that would protect and improve the soil at the same time.

I took a 3-months' course at the California State Polytechnic College at San Luis Obispo in "Crops, Soils, and Range Management." From that course, and more importantly from what I saw in the field with SCS technicians, I was greatly impressed by the nontillage and mulch tillage practices.

Upon my return to Chile, in February 1959, we began on a nontillage program in vineyard, orchard, and rangeland. Our first step was to broadcast blue lupine on 30 acres of rangeland. During

the first year, we cut it with a sickle mower and left it on the surface of the soil.

The following year the lupine was much heavier—a fine stand, 3 feet tall and very thick. When we cut the crop in the blossom stage for green manure, we left a row 1 foot wide at 20-foot intervals to mature for reseeding. We repeated this 1 more year, 3 years in all.

At the end of the third year we tilled with a rotary tiller, working the mulch into the surface of the soil enough to provide a seedbed. We then fertilized with 400 pounds an acre of 16-20-0, and seeded 15 pounds of Lana vetch (inoculated) and 80 pounds of oats an acre.

On this field we made three cuttings of vetch a year, two green cuttings, the last one dry for seed. On the 30 acres we produced 75 tons, dry weight, of forage. Lana vetch makes excellent feed for cattle and hogs. The seed is especially good for chickens.

Our best practice with Lana

vetch is to sow it after establishing a mulch and working the mulch at the surface of the soil, with very light tillage. Lana vetch produced over twice as much hay as crimson clover, which was our next best legume.

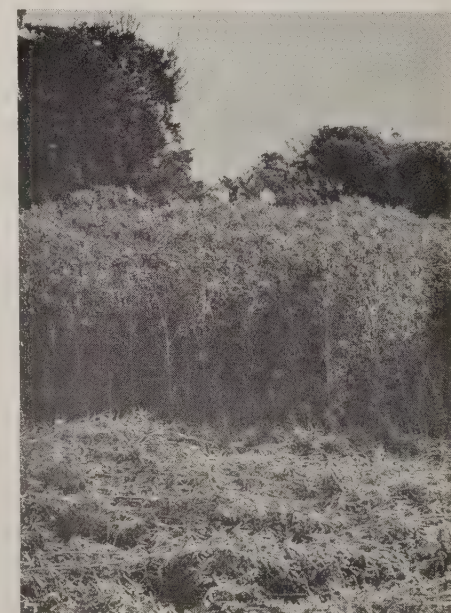
Vineyard improves

After 4 years of nontillage in our vineyard, using blue lupine as a green manure mulch, our production is improving, and there is absolutely no soil loss. Our prunings are cut in small pieces and left on the surface.

Other vineyards in the neighborhood are declining in production and are suffering from soil erosion. The only exceptions to declining yields are where increasingly large amounts of fertilizer are being used. But with soil losses continuing, they are faced with going out of production.

In conclusion, I would say that I have observed and carefully studied the many soil and water conservation practices in the United States, including contouring, strip cropping, terracing, the building of stock ponds, reservoirs, range and forestry conservation, and the complete watershed pro-

Blue lupine in its second year on a once-bare, badly eroded clay loam soil, stands 3 feet high.



tection program.

From my knowledge of our own land in Chile, I am convinced that what we need now, most of all, are the simplest soil protecting and improving practices. They are the easiest to apply and are fundamental:

First of all, to use the land according to its condition and need. In our case, trees for two-thirds of the farm is an example.

Secondly, improve the soil by the simple practice of growing legumes, along with grasses, and using these for mulching, green manure, and soil protection, as well as for grazing and hay. Erosion is stopped, the soil structure improved, water penetration made easier, and fertility increased.

I am also convinced that this program is turning the tide from soil erosion and ultimate abandonment of the land on our farm, to crop and livestock improvement that will bring economic stability. I know that a very large segment of the land in Chile faces the same problems and will require the same remedies.

A few of our neighbors have visited our farm and are impressed by the results obtained so far. Some are beginning to adopt this nontillage, conservation system of farming. I believe that the next few years will further demonstrate the benefits of these measures, and I hope that there will be a spread of influence from this that might usher in a new era of land management in my country. ♦

Hedges for Great Plains

On the central Great Plains hedges are of special value in protecting small areas from wind, drifting sand, sleet, and snow.

It is generally preferable to plant young trees or shrubs. For most deciduous hedges 1-year-old plants from seed or cuttings are best. Slow-growing species may be 2 or more years old.

Pan American Congress Reflects Growing Interest in Conservation

THE FIRST Pan American Soil Conservation Congress being held this month in Sao Paulo, Brazil, grew out of the rising interest in soil and water conservation around the world.

There is new awareness that rapidly expanding needs for food can be met by intelligent care and development of land and water resources.

A recent Economic Research Service study of agricultural progress in 26 developing nations gives a picture of the food crisis confronting mankind. The 26 countries—among them the Latin American nations of Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, and Venezuela—represent three-fourths of the people, food, and income of the less developed lands of the free world.

The ERS study showed that a food deficit equivalent to \$6.8 billion will exist in these areas by 1970, despite improvements being made in agricultural production.

Exchange of ideas

Technicians and scientists in several Pan American countries have discussed for many years the need for a conference at which American nations could exchange data, information, and ideas on resource conservation. The Congress is the outcome of their interest.

Although the Brazilian Government, through the Ministry of Agriculture and the Agriculture Secretary of the State of Sao Paulo, is sponsoring the Congress, several other countries cooperated in planning the program. The Soil Conservation Service has encouraged the undertaking and assisted in arranging the program.

Ten SCS conservationists are at-

tending the Congress.

From the Washington Office: D. A. Williams, administrator; W. R. Van Dersal, deputy administrator; F. A. Prange, assistant to the administrator for international programs; Roy D. Hockensmith, director of Soil Survey Operations; Darnell M. Whitt, director of Plant Sciences Division; John H. Wetzel, assistant deputy administrator for watersheds; and Kenneth M. Kent, head of Central Technical Unit (Hyattsville, Md.).

From the field: J. R. J. Bradshaw, assistant State conservationist, Utah; Laurence D. Giese, State soil scientist, California; and Willie Cumpiano, range conservationist, Puerto Rico.

Papers for the proceedings

Another 20 SCS people have prepared papers for discussion at the Congress and publication in the Proceedings. Thirty additional papers are included from other United States agencies, along with several from U. S. State universities. Papers also will be presented by scientists and government officials from nearly every other nation in the Western Hemisphere.

In addition to the conference discussions, the Congress includes several social events, and 4 days of technical field tours to view agriculture in the State of Sao Paulo.

The printed Proceedings will be a useful compendium of the many opportunities that modern science and technology offer for resource development to meet the food needs of the countries involved, to improve the welfare of rural people, to increase foreign exchange earnings, and to promote economic growth.—ROY D. HOCKENSMITH, *director, Soil Survey Operations, SCS.*

Narrow Strips Find Favor With Tobacco Farmers

By Dentis A. Colson

Conservation Agronomist, SCS, Bowling Green, Ky.

CONSERVATION-MINDED tobacco growers in Kentucky have adapted the practice of strip-cropping to the intensive farming methods their crop requires with good results in soil protection and yields.

The main feature of tobacco strip-cropping is the use of narrow strips to accommodate the number of tobacco rows best suited to the farmer's operations. Cooperators in soil conservation districts, working with conservation technicians, have generally settled on 6 rows as the best width, although fields of 4- or 8-row strips are common.

Conservation farmers began conducting field trials of narrow-width contour strips for tobacco in 1958. The first trials were made in Russell County, Ky., under the supervision of Noble E. Howard, SCS work unit conservationist, on the farms of O. G. Stephens, Ed Edmonds, and Morris Edmonds.

These studies showed that 4- to

6-row strips usually reduce labor costs the most. The narrow strips also enable the farmer to get maximum use of his machinery.

In 1962, the information gathered from the field studies was put into use throughout the State in conservation planning. Since that time the practice has spread rapidly.

Although this method was first tried with tobacco, it is now being used with good results with corn.

Some of the advantages of narrow contour strips for tobacco are:

(1) The sod strips help maintain soil structure, reduce soil compaction, and improve the workability of the soil.

(2) Narrow strips give near maximum protection from soil erosion. Visual observations indicate that the strips reduce soil loss approximately 50 percent more than does regular contour strip-cropping.

(3) Infiltration and water-holding capacity of the soil are in-

creased because of reduced soil compaction.

(4) It is easier to keep the fields smooth. By plowing two strips at the same time ("deadheading" at the ends), the farmer can leave only one open plow furrow along the side of each strip. The strips can be plowed the opposite way the next time, thus helping to keep the strips level.

(5) The land can be prepared for planting tobacco as it is needed, since each strip is a complete field.

(6) Alternate strips of sod allow easier access to all parts of the field to service the farming operation and in hauling the tobacco to the barn.

(7) It is easy to spray the crop for insect control, weed control, and sucker control from the sod strip on each side of the cultivated strip.

(8) It is easier to prime the tobacco when it is grown in narrow strips.

(9) Irrigation equipment is easier to place and to remove, because the sod strips serve as travel lanes. Also, damage to the tobacco leaves can be avoided in this operation.

(10) Tobacco sticks can be distributed directly to the field from the wagon.

(11) The sticks of tobacco can be field-wilted on the sod strips after cutting, without damage from mud if it should rain before the tobacco is housed.

(12) The narrow strips provide better air drainage through the field and under the lower leaves, thus reducing leaf drop.

Recent data from the University of Tennessee Experiment Station indicate that quality of tobacco grown in narrow strips places a

Inexpensive spray equipment is adequate for treating tobacco grown in narrow strips.



larger percentage of the crop in higher price grades than tobacco grown in a solid block.

The report also indicates a slight increase in yield from tobacco grown in narrow strips, due mainly to reduction in leaf droppage.

Grass seed can be harvested from the grass strips or used for hay. Good yields are produced because of the high rate of fertilizing the preceding tobacco crop.

Tobacco is usually harvested during the last half of August or in early September in Kentucky. This makes it possible to seed an early winter cover crop on the tobacco strips. Kentucky 31 tall fescue seeded immediately after tobacco harvest, at the rate of 40 to 50 pounds an acre, and field brome grass seeded at 15 pounds an acre, are gaining favor as winter cover crops. ♦

SCSers at Tuskegee Meeting



SCS representatives attending the annual conference of Professional Agricultural Workers Conference at Tuskegee Institute, Alabama, were: Front row from left—Samuel Combs, Jr., McAlester, Okla.; Carl Lindstrom, Washington, D. C.; J. A. Wilson, Wetumpka, Ala.; Howard J. Hardy, Aiken, S. C.; Plater T. Campbell, Haddam, Conn.; Haney Green, Opelousas, La.; James F. Hughes, Washington, D. C.; Obie L. Masingale, Nashville, Tenn.; L. L. McLemore, Jackson, Miss.; Dr. William H. Farley, Lewiston, Pa.; Alonzo Davis, Hinesville, Ga.; Jimmie K. Simpson, Ft. Worth, Tex.; Theodore Johnson, Jr., Gainesville, Fla.; Robert Williams, L'Anse, Mich. Back row—Joseph C. McKinney, Staunton, Va.; Otis N. Thompson, Washington, D. C.; Albert P. Boyd, Marianna, Fla.; S. W. Avera, Jr., Columbus, Ga.; Willie M. Moore, Fayetteville, Tenn.; Leonard Hardy, Jr., Edenton, N. C.; Thomas H. Baskins, Helena, Ark.; Ezell McLaurin, Jackson, Miss.; Billy F. Headden, Somerville, Tenn.; John E. Cowherd, Columbus, Ohio.

Twenty-four employees of the Soil Conservation Service attended the 23d annual conference of Professional Agricultural Workers Association at Tuskegee Institute in Alabama in December where Federal, State, and local representatives met to review their roles in the war on poverty.

SCSers from 11 States and the District of Columbia participated in the 3-day meeting with some 100 agricultural workers from other Federal and State agencies.

The conference program included speakers from the Department of Agriculture; Department of Labor; Department of Health, Education, and Welfare; and the Office of Economic Opportunity on the theme, "Involving the Whole Community and Local Government Agencies in Attacking the Problem of the Disadvantaged."

James F. Hughes, special assistant to the SCS Administrator on Inter-Group Relations, presided at one of the conference sessions. ♦

Special ACP Practice for Critical Areas

A special practice in the Agricultural Conservation Program in Utah offers ranch operators cost-sharing for "rehabilitation of small critical areas of rangeland which are subject to severe sheet and gully erosion," when fully treated in accordance with a plan approved by the SCS technician and ASCS county committee.

Provisions for the practice were worked out jointly by ASCS, SCS, and the soil and water conservation districts of Utah. It illustrates an interagency approach that could be applied to especially troublesome problems in any land use — cropland, range, pasture, woodland, or wildlife or recreation areas.

The special practice requires (1) a plan for the area, (2) all needed practices for total treatment, (3) provision that all structural and cultural practices be installed during the first 2 years, (4) provision for protection and management for 5 years, and (5) cost-sharing on the total job.

Authorized cost-sharing ranges up to 75 percent of cost for specified operations that might be needed, such as fencing, seeding, earthmoving, and the like. ♦

Recreation Developed in Watershed Projects

Ninety recreation developments in 76 small watershed projects in 30 States have been approved for technical and financial assistance since enabling legislation was enacted in late 1962. Forty-two of these were approved during 1965.

The developments will create 23,000 acres of surface water for recreation and provide other recreation facilities on adjacent lands. Most of the lakes in the developments will range from 100 to 800 acres.

It is estimated that about 4.7 million visitors annually will use the recreation developments. ♦

Full Employment for Resources

By Orville L. Freeman

THIS is your 20th annual convention.

There is another 20th anniversary associated with February of 1966.

I believe there is a relationship between the two that goes beyond a mere coincidence of dates.

This month marks the 20th anniversary of the signing of what A. A. Berle has described as "a basic provision in the constitutional law of the American economic republic"—the Full Employment Act of 1946 . . .

When the Full Employment Act was being debated 20 years ago, who dared to imagine that within two decades our private enterprise system—with resources added by Government when needed—would bring us to the doorway of a trillion-dollar economy?

But, 20 years ago, in the first convention of the National Association of Soil Conservation Districts, who dared imagine that in 1966 we would be well on the way to adapting the full employment guideline to natural resources as well as the economy?

Who thought then that recreation could become a crop more valuable to many a landowner and consumer than corn; that a golf course or lake could serve a community better than a field of cotton?

Who thought then that the resources of rural America could be shaped to make an excellent home for industry and business as well as support an ever-improving agriculture?

Who thought then that districts

would be considering today a series of proposals to apply their skills in conservation planning and practices to the broad range of natural resource uses essential to community development?

Thus we come closer to a true understanding of conservation. When wise use of natural resources is combined with the programs of health and education to improve human resources, we see more clearly that conservation is concerned not with nature alone but with the total relation between man and the world around him. The objective is to raise the quality of life and to give it new dimension.

If we have the will we can be well on the way to reaching maximum multiple utilization of the great resources of rural America by the time we reach a trillion-dollar economy.

The record of resource conservation-development-use of the last half dozen years can be favorably compared to the economic growth record. Soil and water conservation districts have had either leadership or supporting roles in most of it. We must now make sure that the record of the next 5 years is just as good . . .

We can well question the advisability of achieving a trillion-dollar economy if we get it at the cost of increased pollution of air and water; increased pollution of the social and cultural lives of human beings resulting from piling up too many of them in too few cities; increased congestion in everything from traffic to kindergarten classrooms.

For the well-being of the whole of the Nation—urban and rural—the greatest contribution that rural leadership can make to our generation is to make it possible for

people to live rich and rewarding lives where the space is—on the countryside.

That space must, of course, be equipped with adequate educational and health services, water distribution and sanitation systems, facilities for job training, social services. And it must be marked by more industries, more businesses, more service institutions, because to live successfully in rural America, men and women must be able to work there.

Perhaps the fastest way to describe our task is that of rebuilding the gates of rural America so they open *in* as well as *out*.

This you can do. And the doing is filled with excitement and challenge. ♦

NACD for Broader District Action

BROADER programs and responsibilities for local conservation districts are the goal of actions taken by the National Association of Soil and Water Conservation Districts (NACD) at its twentieth annual convention in New Orleans in February.

The Association adopted resolutions endorsing the report of its Special Committee on District Outlook, released at the convention.

The report, *The Future of Districts*, culminates a 2-year review under the chairmanship of John Wilder of Tennessee of resource conservation programs in the United States.

In brief, it recommends that districts should no longer limit their activities to "soil and water" conservation nor to agricultural interests.

Rather, the administrative ma-

From remarks before the 20th annual convention of the National Association of Soil and Water Conservation Districts at New Orleans, February 8, delivered for the Secretary of Agriculture by Under Secretary John A. Schnittker.

chinery and experienced leadership built up through 30 years of dealing with farm and ranch conservation problems should be applied to the entire range of natural resources to serve the needs of the Nation's entire population.

The report recognizes that changes in legislation would be needed in most States to enable districts to operate effectively in such a broad field.

The resolutions pledge NACD to offer assistance to conservation districts "in bringing about desirable amendments to State enabling laws, adopting improved operating

policies, and securing needed assistance from governmental agencies."

The position of the association is in agreement with that of the Department of Agriculture expressed by Secretary Orville L. Freeman at the 1962 NACD convention when he invited districts to enter into revised Memorandums of Understanding covering broadened programs of resource conservation. To date more than 2,000 individual districts have modernized their programs and signed new agreements with the Department. ♦



CONSERVATION PROFILE

Elmer E. Peterson Oregon

Country life not secluded for conservation winner

THE MAN who said, "If you want to live a secluded life, move to the country," certainly wasn't talking to Elmer E. Peterson of Sauvie Island in the Columbia River at Portland, Ore.

Even living on an island isn't far enough removed for him to be forgotten by his fellow conservationists who recently saw him named by the National Wildlife Federation as Soil Conservationist of the Year for 1965.

A native Oregonian, Mr. Peterson has lived on Sauvie Island since he was 8 years old. The son of a dairyman, he grew up on a farm where he learned conservation at an early age.

He became even more involved in soil conservation in 1947 when he was elected to the board of



supervisors of the Sauvie Island Soil Conservation District.

Top dairy farmer

A top dairy farmer and conservationist in his own right, Peterson carried out most of the practices in his conservation farm plan. For most men, operating a dairy farm would be a full-time job. But Peterson finds time also to serve as a district supervisor, a position he has held for 16 years. He is currently district secretary and has served several terms as chairman.

He also is a director of the Columbia Drainage District, which has developed a drainage plan for the area in cooperation with local,

State, and Federal agencies.

He has served as an area director of the Oregon Association of Soil and Water Conservation Districts for 10 years and is serving his eighth year as president of the OSC&WD. As president, Peterson has been instrumental in working for enactment of legislation that has furthered the soil and water conservation program in Oregon. He also has developed soil judging and speaking contests for high schools in Oregon. And, he has been the prime mover in development of newsletters, folders, and brochures on soil conservation and related subjects to publicize the work of the association.

Elmer Peterson led the movement to secure the National Association of Soil and Water Conservation Districts' annual meeting for Portland in 1965. He served as local arrangements chairman for the gathering that brought 1,500 soil and water conservationists from all parts of the United States to Oregon.

NACD director

Peterson was selected recently by his fellow district supervisors as a director from the West to serve on the board of the National Association of Soil and Water Conservation Districts. He also is on NACD's Finance and Shore Erosion committees.

In 1965 he was appointed to the State Soil and Water Conservation Committee of Oregon.

Recently, he journeyed to Alaska to help develop and organize an association of soil conservation districts for that State.

He is a member of the Soil Conservation Society of America. He has served as a member of the Sauvie Island School Board for many years.

In January, this year, he made a trip to Washington, D. C., to receive 1 of 10 national awards in natural resources made by the National Wildlife Federation and the Sears Roebuck Foundation. ♦

Districts Help Heal Mine Spoil in Appalachia

MORE THAN 3,400 private landowners received help from soil conservation districts in applying treatment on strip mine spoil areas in the 12 Appalachian States, a survey by the Soil Conservation Service shows.

SCS Administrator D. A. Williams, in October 1965, asked for a report on the application of land treatment in Appalachia. The survey was made on privately owned lands surface mined for coal, clay, sand, and gravel.

In a 5-year period from 1960-64, 177 districts assisted in treatment of spoil on 85,000 acres.

In addition to technical assistance provided by SCS in designing conservation practices, the districts contracted to do the total installation job for about 25 percent of the cooperators. Districts furnished needed equipment for another 20 percent of landowners who did their own jobs.

Trees were planted on 2 of each 3 acres treated. Other practices developed include wildlife and recreation on 14 percent, pastures on 12 percent, and 6 percent was equally divided between land cultivation and building sites.

Nearly 500 water-control structures—dams, spillways, drop structures—were installed.

Treatment costs per acre varied from \$2 to \$6,000—from tree planting to residential subdivisions.

The 1965 Appalachian Regional Development Act authorized the Secretary of Interior to make a comprehensive strip mine study and survey of the region by 1966.—T. B. PLAIR, *Woodland Conservationist*, SCS, Washington, D.C. ♦

Ponds yield the best fishing if they are built and managed primarily for fish production and fishing. ♦



Soil Fertility and Fertilizers.

By SAMUEL L. TISDALE AND NELSON L. WERNER. 1966. 2d ed. Macmillan Co., New York. 694 pp., illus. \$12.50.

This edition of a well-known text on fertilizers is more than a reprint of the first one. It is almost a complete revision. Many of the 17 chapters have been expanded. Each contains a good bibliography for use by college students and others who are interested in additional information. New chapters on efficient use of water, basic soil-plant relationships, and fertilizers have been added.

The information is well documented with fertilizer research results, most of which deal with the production of a few major crops. The subject of minor elements is well treated. There is, however, little attention given to the need and response of pastures to proper fertilization.

Four chapters — Fundamentals of Fertilizer Application, Cropping Systems and Soil Management, Economics of Lime and Fertilizer Use, and Fertilizers and Efficient Use of Water—are of particular interest to conservationists working with farmers.—B. D. BLAKELY, *Head Agronomist*, SCS.

New Publications

Natural Resources of Texas. PREPARED BY U. S. DEPARTMENT OF THE INTERIOR. 1965. *With contributions from the Forest Service, the Public Health Service, the Soil Conservation Service, and the U. S. Army Corps of Engineers.* 64 pp., illus. \$0.45. A beautifully illustrated booklet describing Texas' history, physical characteristics, fish and wildlife, water and power, forests, agriculture, minerals, parks and recreation opportunities, Indians, and programs of Federal natural resource agencies in the State.

The booklet is the 13th in an informational series on the natural resources of

various States. It is however, the first one in which the work of the Soil Conservation Service has been discussed in the section on "Programs of Federal Natural Resource Agencies." Except for the few paragraphs contributed by SCS, this booklet, like the others, treats resource conservation as a function carried out by public agencies on public land. In Texas, Federal land accounts for 1.7 percent of the total.

The other Natural Resource booklets in the series published to date are on the States of Nevada, Massachusetts, Colorado, Arizona, Oregon, Ohio, Montana, Washington, New Mexico, West Virginia, Idaho, Utah.

Snow Surveys. By ROBERT T. DAVIS. 1965. *USDA Agr. Inf. Bul. 302.* 16 pp., illus. The bulletin tells how information on expected streamflow from snowmelt, probable high water along snowmelt streams, and depth and duration of snowpacks from previous years is obtained from measuring the snow on watersheds. Snow courses, snow sampling equipment, soil moisture stations, and the processing and release of water supply forecasts are described.

Aquatic Pests on Irrigation Systems, By N. E. OTTO AND T. R. BARTLEY. 1965. *Illustrated by D. W. Cunningham.* U. S. Dept. of Interior. 72 pp., 30 color plates; pocket size. \$1.75. Full-page color illustrations provide a simple field guide to identification of 26 species or larger groups of aquatic plants and 4 kinds of invertebrate animals that often become pests in irrigation systems. Simple narrative descriptions supplement the drawings.

Handbook of Agricultural Charts, 1965. 1965. *USDA Agr. Hdbk. 300.* 159 pp., illus. These charts give graphical data on the situation, commodity trends, foreign trade, marketing developments, population and rural development, and the family.

Soil Surveys

Finney County, Kansas. By RODNEY F. HARNER, RAYMOND C. ANGELL, MARION A. LOBMEYER, AND DONALD R. JANTZ. 1965. 91 pp., illus.; maps 3.17 inches to the mile (1:20,000).

Scott County, Kansas. By KENNETH H. SALLEE AND VERNON L. HAMILTON. 1965. 66 pp., illus.; maps 3.17 inches to the mile (1:20,000).

Morgan County, Georgia. By HARLEY H. PAYNE. 1965. 75 pp., illus.; maps 4 inches to the mile (1:15,840). Soils surveyed by Harley H. Payne and Jerry A. Pilkinton.

From the Administrator:

World Food and Soil Conservation



THERE is every reason for nations of the world to take immediate action to conserve their soil and water resources to assure the continued and increased production of needed food and fiber.

In most countries population growth is creating critical pressures on available food lands. As I travel in various parts of the world, I am convinced that many nations must initiate drastic measures immediately to increase food production.

The First Pan American Soil Conservation Congress being held this month at Sao Paulo, Brazil, is an indication of the interest that countries of the Western Hemisphere have in the conservation of soil and water resources. Further evidence of such interest is the Third Session of the Food and Agriculture Organization's Working Party on Pasture and Fodder Development in Tropical America, also being held this month in Trinidad.

The Soil Conservation Service is actively cooperating with the Agency for International Development in providing technical assistance to many countries. Our contribution includes working with officials and technicians of each nation in organizing conservation programs and in training personnel to work with local people in applying conservation measures.

Technicians of the Soil Conservation Service who receive these assignments find them to be as challenging and rewarding as any of the home front. Through their experiences in many lands and the exchange of ideas with citizens of other countries, there is being built up a corps of international conservation workers competent to

deal with the varied and complex resource problems of the free world.

Just such a development of professional conservation personnel had to take place in the United States before soil and water conservation could become an effective force in this country. The lessons learned here, both in principles of administration and in the fundamentals of resource use, now can be put to service in the wider arena of world affairs.

Certainly, conservation of soil and water is basic to rural development and a permanent productive agriculture in any country. Improved crop varieties, fertilization, insect and disease control, better harvesting methods, improved breeding and management of livestock, and more efficient marketing practices, important as they are, can give only temporary relief to the farmer or the nation that is losing productive soil at a dangerous rate.

Likewise, the prices obtained for agricultural commodities mean little to people who cannot produce enough food and fiber for home consumption because of soil impoverishment.

In many parts of the world, productive land and available water are limited. Productivity of much of the once good land has been reduced by erosion and misuse. There are vast areas in many countries that need fundamental changes in land use and the application of conservation treatments. Several of them, such as New Zealand, Thailand, and India, have enacted conservation legislation giving national emphasis to improving soil and water management.

Cultivated lands occupy only

one-tenth of the land surface of the earth but they produce most of the food for mankind. Seventy percent of the harvested area is used to grow grain—a basic food which directly provides nearly half the calories for the world population.

Fertilizing is essential to increasing yields. In many areas, yields could be doubled or tripled with fertilizers and improved techniques that would reduce runoff and make use of available water.

Grasslands occupy about 20 percent of the world's land surface. Most of these areas are unsuited for the production of cultivated crops.

A large share of the total feed requirements for the world's livestock comes from these grazing lands. Chiefly because of poor management, in many parts of the world they are failing to contribute their share to production of food for animals and thus for man.

The management of these areas is of vital importance to sustained production. Work of such magnitude, particularly when it is widely dispersed, obviously cannot be accomplished to best advantage without a national policy of soil conservation, the teamwork of many minds, and correlated action on many fronts.

Such international meetings as the Pan American Soil Conservation Congress focus attention on conservation as the basis of world food production. They help to crystallize the growing body of knowledge in the new profession of soil conservation.

It is to be hoped that the Soil Conservation Congress will become a regular event, as have similar international meetings in such specialized fields as soils, forestry, grassland, and water management. Surely, soil and water conservation, which includes all these specialties, deserves an equal forum of international discussion.

D. A. WILLIAMS



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Rough Tillage for Wheatland

ROUGH fall tillage is one conservation measure that all farmers can practice, says George Gault, wheat farmer in eastern Washington's Central Whitman Soil and Water Conservation District. And that's a boon to an area where farmers find it difficult to control erosion on irregular steep slopes.

It's easy to put a field in rough-clod shape, he says. A moldboard plow is all that is needed.

The soil must be dry, so plowing must be done before the fall rains come. Gault rough-plows his pea field right after harvest, then seeds the field to winter wheat with no other tillage before or after drilling. He points out that green manure should be plowed as late as possible so that the soil moisture is used up.

Rough fall tillage and minimum tillage go hand in hand, Gault says. Farmers who prepare a fine seedbed for winter grain can expect large erosion losses. A fine seedbed destroys the physical structure of the soil and breaks down soil organic matter faster, causing the soil to "puddle" with the first fall rains; some water soaks in, but most of it runs off and erodes the finely worked ground. In the

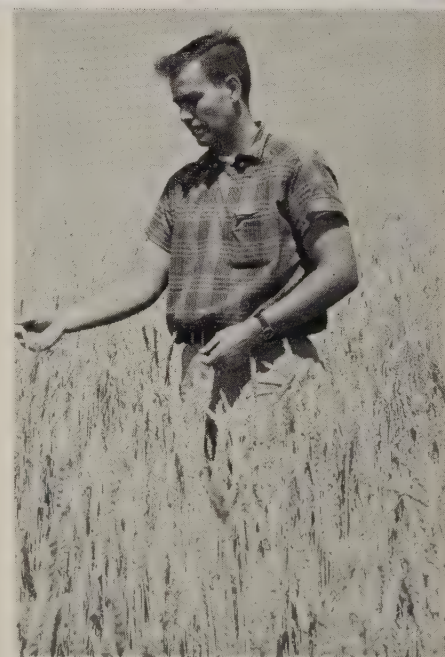


rough-tilled soil, millions of tiny dams and ponds hold large amounts of water and check erosion, even on steep land.

The cloddy seedbed may make drilling difficult. But rough tillage eliminates two or three field operations, and the increased water absorption, soil aeration, and better soil bacteria activity more than offset this disadvantage, Gault says.

If a drill can't be used over the rough-tilled ground, wheat can be broadcast. — JUDD MELTON, *Soil Conservationist, SCS, Fairfield, Wash.* ♦

Winter wheat is seeded on a field that was rough tilled following the harvest of a pea crop. Soil Conservationist Judd Melton (r.) checks Brevor White winter wheat crop planted on rough plowed ground.



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SOIL Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

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RURAL DEVELOPMENT IN WATERSHEDS

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CRISIS IN THE COUNTRYSIDE—Soil Stewardship theme—Page 231



Development . . .

People working together in the heartland valleys of the Nation are reaping the rewards of renewed economy and improved rural environment as they move forward with small watershed projects.

Work Unit Conservationist John Essman gives details (p. 219) of how one project brought new industry, jobs, and public facilities, including recreation, to a small Appalachian community.

From another State comes Soil Conservationist Everett Leadbetter's report (p. 228) of how conservation work crews operated by soil conservation districts give jobs to underemployed rural residents.

Such examples, duplicated by the thousands across the Nation, point a practical design for the expanding effort in rural community development, now of major concern to the Congress and the Administration.

Land in Between: This year's Soil Stewardship theme also focuses on our vital rural hinterland—the Land in Between, from which our cities and towns draw their sustenance and where urban people must turn increasingly for the amenities of pleasant living space.

We are challenged by the crisis imminent in public indifference to the Land in Between in NACD's annual Soil Stewardship booklet, *Crisis in the Countryside*. Executive Secretary Gordon Zimmerman introduces excerpts (p. 231) worthy of wide-spread repetition.

COVER: A small lake in the Caney Creek watershed, Cross County Soil and Water Conservation District, Ark., is typical of scores across the country providing new recreation opportunities as a result of small watershed projects.

Soil Conservation

Devoted to the wise use of land and water resources

May 1966

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TO BOLSTER a sagging economy common to many Appalachian communities, residents of Duck Creek Valley in southeastern Ohio first are reshaping their land and water resources.

Taking the challenge for a better life, the Buckeyes have enlisted county, State, and Federal aid to augment their own local ambition and literally "moved mountains" to bring prosperity back to their valley.

They are hard at work on the West Fork of Duck Creek Watershed Project, and the project's economic effects already are being felt throughout the valley.

Project contractors are hiring many local men.

Materials of all kinds are being purchased from local businesses.

Farmers are showing new interest in their land as they invest in sound conservation improvements.

Housing and commercial developments and a new airport are other indicators of a brighter future.

Water was the problem

At the root of Duck Creek's stagnated economy was the basic resource—water. Too many floods had combined with a municipal water shortage to bring hardship to most valley residents.

Steep hills and narrow valleys hemmed in tributaries of the 106-square-mile watershed drained by the West Fork of Duck Creek. Unharnessed water crowding through silt-clogged channels often spread across several thousand acres in the 24-mile-long valley.

More than once a year homes, highways, businesses, industries, and railroads as well as rich farmland bore the brunt of the on-

Reshaping Appalachia

Ohioans Build a Brighter Future Through Watershed Projects

By John L. Essman

Work Unit Conservationist, SCS, Caldwell, Ohio

slaughts. Polluted municipal water topped off the problem.

In eight valley villages a total of 75 percent of the people were directly affected. An average of \$79,000 in flood damages was being

siphoned out of the valley's economy each year by the flood hazard.

Compounding the high-water problem, a water shortage threat continually hung over the valley settlements.



Gabriel Lerner of SCS makes an elevation check during construction of Wolf Run Reservoir.

Caldwell, the county seat and leading business community, had reached critical limits in depletion of its water supply reservoir.

Belle Valley, 3 miles upstream, was existing on well water that was inadequate in both quality and quantity.

Each wave of high water contaminated these wells, forcing residents to haul water from distant sources. Similar water shortages existed in varying degrees in nearby villages.

The watershed project

The resource problem came to a head in the late fifties after a series of floods that left a half-million-dollar trail of damages through the valley. Original thinking on a watershed protection project included both the West and East Forks of Duck Creek covering 183,866 acres.

Sponsoring groups headed by the Muskingum Conservancy District, Ohio's Department of Natural Resources, and Noble, Guernsey, and Washington soil and water conservation districts, decided too much was involved for a single watershed project. Two separate projects could expedite the work, they advised. West Fork, where the need was greatest, was given priority to move first.

Applying for aid under the

Watershed Protection and Flood Prevention Act, Public Law 566, the sponsors got help from the Soil Conservation Service in planning the project measures.

The Ohio State Government gave the project's multiple benefits a big boost when it earmarked \$328,000 of its capital investments fund for construction of the Wolf Run Lake recreation area in the watershed.

The Ohio Department of Natural Resources had been considering the recreation project for several years. Now the watershed project made the idea more feasible.

Adding this money to Federal watershed construction funds enabled the Department of Natural Resources and SCS planners to design a multiple-purpose dam that would provide municipal water for three communities and public recreation as well as flood-water storage.

Wolf Run Dam, with top priority for construction, became a key part of the watershed project. The existing Caldwell water supply reservoir, constructed in 1935, was slated to have an enlarged dam and spillway to add floodwater storage capabilities to its present use. Six additional dams, located in strategic parts of the watershed, were planned as the backbone of the project's structural improve-

ments. Twenty miles of improved channels on the main stream were also scheduled to further reduce the high-water hazard.

Land improved, too

Needed land treatment measures were planned as an essential part of the project to augment the structural work. Erosion in the uplands had to be controlled to keep new channels and reservoirs free of sediment.

Of the 462 farms in the watershed, owners and operators of more than 30 percent were already cooperators with local soil and water conservation districts. Increased conservation farm planning assistance to these landowners and new district cooperators was provided by SCS through watershed funds.

Added technical aid for woodland problems came from the Forest Service. Stripcropping, diversions, ponds, and improved grassland plus other conservation measures were scheduled. The end result would hold topsoil in place, reduce excess water runoff, and thereby eliminate much of the sediment in the streams below.

By July 1964, the project work plan was completely developed, approved, and ready to be put in operation.

"Local interest in the project

Route 78 was often made impassable by raging floodwaters before installation of the West Fork of Duck Creek Watershed Project.





Floodwaters surround this typical Appalachian home along Duck Creek several times a year.

proved its real value here," recalls Robert Ball, chairman of the steering committee. "In record time we had all the easements and rights-of-way needed to start letting contracts on the first dam."

Ball, a native farmer and treasurer of the Noble District, had been a strong backer of the project for years. His 440-acre beef cattle farm had been flooded more times than he could remember.

"One year was especially bad," Ball comments. "We had 13 floods in 12 months. My place, along with dozens of others, was swamped. We couldn't exist too much longer with the problem."

Wolf Run Dam is now nearing completion. With it will come a 1,143-acre, State-owned recreation area surrounding the 220-acre reservoir. The facility will include camping areas, picnic grounds, boat docks and ramps, beaches, and ample room for good fishing. In addition, the villages of Caldwell, Florence, and Belle Valley will have nearly a half-million gallons more water a day available for municipal and industrial use—which will double their present supplies.

Confidence in their prosperous future is well indicated by the valley's new million-dollar Noble County Airport. Its 5,000-foot hard surface runway, carved out of two mountains and a valley, lies just above the new Wolf Run site.

Confidence in the future

Assured of flood protection and ample water supplies, the local people invested their own capital, equipment, and time in the airport. They predict that it will be a big drawing card in their drive to attract new industry and vacationists.

Further promoting this drive for new business, local leaders raised \$1,000 for a full-page ad in the *Wall Street Journal*.

There are further signs that the valley is moving ahead. A 728-acre agricultural research center has been located in the watershed, to study agricultural and recreational uses of the hill lands of southern Ohio.

A \$165,000 nursing home, just dedicated in December, will have a staff of up to 17 doctors and nurses. Its owner attributes its construction directly to the expected economic growth caused by the watershed project.

A 9-hole golf course has been built on flood-plain land, replacing 30 acres of continuous corn. Construction has begun on a new wood processing mill that will employ up to 25 persons. One new hotel has opened, and two apartment buildings are under construction. And more than \$20 million worth of highway contracts will be let in the valley this year.

Word is spreading

Word of the project's success is spreading to neighboring valleys. East Fork of Duck Creek is proceeding with its watershed plan. Nearby Buffalo Creek has a project approved by Congress with land easements the next goal to be achieved. Other communities have similar Public Law 566 proj-

ects in various stages of planning.

Within the next 5 years Duck Creek Valley residents will see many results of their past years of planning and perseverance. Agricultural damages will drop an estimated 82 percent. Urban damages from floods will be all but eliminated, saving \$15,000 a year. Another \$20,000 will be saved each year on highways, bridge and railroad repairs.

Total costs for the project are estimated at \$3,782,677. The Federal share is approximately \$2,568,668, and State and local funds will cover the remaining costs. For each dollar spent the valley will gain \$1.40 in benefits.

Commenting on their project's

Changing times around Caldwell are typified by construction of the Wolf Run Reservoir (middle) and Noble County Airport (background).



success, Ball says, "Our watershed project is a fine example of what can be done by local people who want to help themselves. Add this interest to the assistance we are getting from the State and Federal Governments and you have real democracy in action."

Watershed Lakes Bring Recreation Activity to Kansas Flinthills

By G. W. Davidson

Work Unit Conservationist, SCS, Sedan, Kans.

WATERSHED construction in Chautauqua County has focused attention on Kansas' most scenic area.

Eighty lakes under construction in five Public Law 566 watershed projects headquartered in Chautauqua County are located in the rugged topography with clear streams draining from tall grass cover associated with the world famous Flinthill area.

This combination of clear lakes situated in an unbroken grassland area offers great recreation possibilities for this part of Kansas. These lakes are the permanent pool areas of floodwater-retarding structures ranging in size from 5 to 470 surface acres.

Two multiple-purpose structures are completed and a third is under construction. Two of the three are for municipal water supply and will have some recreation planned by the cities of Sedan and Caney.

The third furnishes 13,000 acre-feet of storage on a 3,000-acre Scout Ranch owned and operated by the Quivira Council, B.S.A., located at Wichita, Kans. The council purchased 8,000 acre-feet of storage for its aquatic program of fishing, boating, canoeing, life saving, and to provide recreation for a potential of 6,000 Scouts.

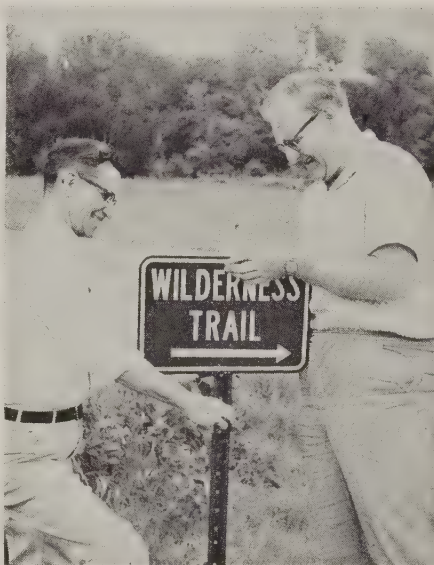
The SeKan Council, B.S.A., located at Independence, Kans., has taken a long-term lease on a 31-acre pilot watershed lake in the eastern part of the county to pro-

Duck Creek Valley will be a healthier, happier, safer, and more profitable place to live. The next generation will enjoy the long-range benefits. For this reason the Duck Creek Ohioans are glad they moved some mountains to make room for prosperity. ♦

vide recreation for its camps. These two Boy Scout councils located camps in this county because of its rough wilderness appearance and plenty of clear fresh water.

The Caneyland Development Association was organized recently covering approximately 600,000 acres in the county and areas around the 80-lake complex. The primary objective of this organization is to furnish information to landowners seeking ways to establish income-producing recreation enterprises, particularly around permanent pools of watershed lakes. The organization is

The Reverend Clarence Brooks (l.) and Raymond Tredway of the Sedan Chamber of Commerce erect the last of 100 signs purchased by the Sedan Chamber of Commerce and Lions Club to mark the 75-mile Wilderness Trail.



being assisted by the local Technical Action Panel Committee consisting of representatives of all Department of Agriculture agencies in the area.

The local Chamber of Commerce initiated a redbud tour 6 years ago by marking routes in the county and publicizing the scenic drives. Each year the tour has grown, and now several hundred people drive hundreds of miles to see the redbuds in bloom.

A "Wilderness Trail" has been marked with large metal signs directing people through some of the most scenic areas and to sites having historical interest from the old frontier days.

Local people are organizing and becoming interested in projects that will attract tourists into this part of their State.

Recently, the two Senators from Kansas introduced a bill in Congress that would provide a Prairie Parkway Trail through the State and bisect Chautauqua County. The trail would offer an opportunity to see the Bluestem Hill country with all of its natural beauty and provide a direct route to this recreation area. ♦

SCS Assists Foreign Groups and Individuals

In 1965 some 416 foreign nationals received training assistance from SCS. This figure includes 242 members of groups or teams that visited the Washington Office and one or more field locations and 174 on individual assignments that varied from a few days to several months.

In total, these individuals and groups spent 4,429 man-days with SCS.

Either the Agency for International Development, the Food and Agricultural Organization of the United Nations, private foundations, or their own governments sponsored the individuals and groups. A few came at their own expense. ♦

In watershed projects . . .

Channel Improvements Aid Water Control and Use

By E. D. Butler

State Conservation Engineer, SCS, Little Rock, Ark.

Improved channels also serve other useful functions, including agricultural water management, diversion of water to control erosion and sediment, recreation, and other purposes—either singly or in combination with flood prevention.

The importance of stream channel improvements is indicated by the fact that they comprise 31 percent of the total cost of all structural measures planned on Public Law 566 watershed projects as of last June—\$220.2 million out of \$717.2 million.

Large and small

Some of these are large concrete-lined channels that protect valuable urban property. Others are small earth channels that protect agricultural crops. Most of the channel improvement work in Public Law 566 projects is somewhere between these two extremes—medium-sized ditches protected with some natural vegetation and

grade stabilization structures.

The purpose, location, bed and bank materials, and cost of channel improvements all have some bearing on the criteria and procedures used to design and construct the channels.

Complex channel improvement work, involving peak runoff determination, bank erosion and channel degradation problems, and soil materials testing, requires the skilled services of a design engineer, hydrologist, geologist, and the materials testing laboratory. On channels that have gentle gradients and stable soils, a less specialized technical approach can be used.

Design methods

Depending on the level of protection required, design discharges for channels are determined by one of two methods.

A reinforced concrete drop spillway is one form of structure useful for stabilizing channels.



On relatively flat lands with gentle gradients, improved channels need not be lined.

STREAM CHANNEL improvements serve many uses in the small watershed program under Public Law 566.

Where land treatment measures and floodwater-retarding dams alone cannot provide enough flood protection to a watershed, natural drainageways are enlarged enough to carry excess runoff safely within streambanks or to remove floodwater before significant damage occurs.



One method is to design the channel for a peak rate of discharge for a selected frequency of occurrence. An example might be a channel benefiting an urban area where the project objective is to provide protection from a storm expected to occur only once in a hundred years.

The second method is to determine the rate of discharge required to remove a volume of runoff within a specified time. This method is often used on agricultural land where it is impractical or uneconomical to construct a ditch large enough to prevent temporary flooding. The channel is designed to remove floodwater in a predetermined number of hours before significant damage occurs to crops.

One of the most difficult phases of channel design is planning unlined earth channels with acceptable limits of stability. Two procedures are used by SCS to establish these limits: (1) The allowable velocities procedure and (2) the allowable tractive force procedure. These procedures are based on the concept that movement of the materials in the bed and banks of a channel will not occur if certain conditions of flow with respect to the soil materials are met.

The allowable velocities procedure is based on past experience and limited research on water velocities with different bed and bank soil materials. Nonerosive velocities vary on a given soil material with changes in channel alignment, bank slope, depth of flow, suspended load and bedload, and other factors.

The allowable tractive force procedure may be used for coarse-grained soils. This method evaluates the shear at the interface between flowing water and the periphery of the channel. The ability of soil materials forming the channel to resist these shear forces is then calculated from properties determined by laboratory and field tests. When unstable



A concrete-lined major channel provides flood protection for urban as well as rural residents.

banks or channel beds are anticipated, protective linings or grade control structures are provided.

Linings and structures

Bank protection and channel linings are used to protect channel surfaces against erosion caused by movement of water and transported materials and from shallow surface sliding. This protection is provided by using vegetation, revetments, retards, rock riprap, rock and wire mattress, sacked concrete, grouted rock riprap, concrete paving, and other materials, depending upon site conditions and erosion hazards.

Grade-control structures are used to reduce the gradient in channel reaches where the channel materials will not resist erosive forces. Reducing the gradient reduces velocity.

Drop spillways, chutes, culverts, hooded inlets, and drop inlets are all used for grade control. The site configuration, foundation condition, availability of structural materials, hydraulics and structural adequacy, and economic factors all help determine the suitability and design of these structures.

An example of the benefits from stream channel improvement is the Caney Creek watershed, covering 40,000 acres near Wynne, Ark. This project was planned with seven small floodwater-retarding structures, 40 miles of channel improvements, and 354 acres of critical area stabilization. The channel improvements, costing \$330,000, are low-velocity unlined channels with corrugated metal pipe overfall structures that provide grade control where side drains enter the channels.

Benefits to a city

The channels benefit the city of Wynne and 20,000 acres of agricultural land. Before the project was completed in 1965, approximately one-third of Wynne was flooded by each storm. Many streets and stores were flooded an average of five times each year. Moving merchandise out of reach of floodwater was a regular job.

After the project was installed, Mayor Harold N. Falls of Wynne said, "More than 6 inches of rain was received last September 10 and 11, and no flooding occurred in the city. In fact, the ditches that run through town were at only about 40 percent of their capacity."

Gilbert Quessenberry, manager of Wynne water and sewer system, said, "In the 23 years that I have been affiliated with the city water system, this is the first time that all storm sewers emptied immediately after a heavy rain."

Local interests spent approximately \$50,000 rebuilding bridges in the watershed while channels were being enlarged. County Judge Homer Mitchell said, "None of the county roads in the watershed was flooded by the large rains received the first part of September. I was highly pleased with the watershed channels because both the county roads and farmers' crops were protected. The 33 bridges in the watershed will last a long time because proper channels have been constructed to carry all runoff without damaging roadbeds and bridge structures. I wish that every watershed in the county had the same treatment." ♦

Snow Survey Indicates Good Water Supply

Good-to-excellent water supplies are in prospect for most of the West this summer, according to preliminary reports from snow surveys conducted by the Soil Conservation Service and cooperating agencies.

Snowfall to February 1 ranged from 80 to 100 percent of average for the date with few exceptions. In addition, the high runoff last spring left reservoirs with more than usual water in storage—especially those reservoirs that serve irrigation and municipal needs.

Given average snowfall for the rest of the season, the combination of high carryover storage and average streamflow is expected to provide reasonably adequate water supplies this summer.

The only deficiency in snowfall existed in eastern Oregon and southeastern Washington, extending into northern Nevada. ♦

River Basin Districts Plan for Water Management in Mississippi

By W. L. Heard

State Conservationist, SCS, Jackson, Miss.

MISSISSIPPI is providing for comprehensive river basin studies and water resource development through a new type of water management district created by individual acts of the State legislature.

Each district consists of a river basin several times the size of watersheds authorized for projects under the Watershed Protection and Flood Prevention Act.

Funds and authority

The districts are provided with funds from State and county sources and have broad authority to carry on resource development and conservation activities.

Four such river basin districts now cover about two-thirds of the State. Most of the remainder is included in the Yazoo-Little Tallahatchie flood prevention watershed

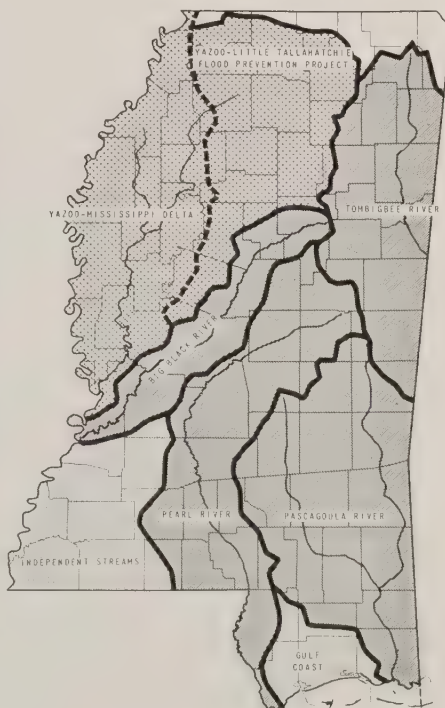
and Mississippi delta lands covered by other river basin studies.

These locally managed action agencies are a logical outgrowth of earlier basin studies conducted by USDA agencies in cooperation with the Mississippi Board of Water Commissioners. The studies on the Tombigbee basin, the Yazoo River Delta, and other areas provided basic information for planning small watershed projects and other conservation programs, but there were no basin-wide action programs.

Tombigbee Valley District

The State Legislature authorized the organization of the Tombigbee Valley Water Management District, the first of the four, in 1960. It provided a way for the governing bodies of the 16 counties in the river basin to join in the common effort. It gave the district broad powers to translate plans into action. It further provided for member counties to assess one-half mill in taxes and for the State to return four times as much for the operation of the district. Today about half the counties in the eligible area in the northeastern part of the State have qualified for membership, the district is organized, and work is under way.

Then conservationists in south-



Water resource studies and development programs for practically all of Mississippi have been provided for through (1) river basin water management districts covering the Tombigbee, Big Black, Pearl, and Pascagoula River basins, (2) cooperative comprehensive river basin surveys for the Independent Streams and Gulf Coast areas, and (3) the USDA flood prevention program for Yazoo-Little Tallahatchie and a comprehensive river basin survey for the Yazoo-Mississippi Delta areas.

eastern Mississippi made common cause with a group seeking to develop the Pascagoula River for navigation and organized the Pat Harrison Waterway District. Enabling legislation put the 15 counties in the basin in the district but provided that a county might be removed by its supervisors. None withdrew. Each county supplies one-half mill of tax money to the district, and the State returns 1½ mills.

The Legislature also passed legislation enabling the counties in the basins of the Pearl River and the Big Black River to set up river basin water management districts. Financing arrangements are somewhat similar to those of the Pat Harrison District, but the basis for counties to enter the district varies.

The Pearl River Basin Development District is organized and functioning but without the participation of all of the 21 counties having some land in the basin. Supporters of the Big Black River Basin District hope to solve their organizational problems and have the district in operation within the year.

Basic functions

While details of State authorizations for the four river basin water management districts vary, they all provide for three important functions:

- (1) An effective and widely representative organization that can cooperate with Federal and State agencies, agencies of other States, and subdivisions of State Government, to plan and establish measures for the development of the basin's water and related land resources.

- (2) Reasonably adequate financing from State and county sources.

- (3) Broad authorities to construct, own, and operate such structures as reservoirs, dams, levees, canals, and related water development projects "to insure adequate water supply for domes-

tic, commercial, municipal, industrial, agricultural, and recreational uses." They also provide for activities in soil and water conservation, flood control, pollution abatement, timber development, navigation, and irrigation work.

How they work

How do the districts work?

They cooperate with the Mississippi Board of Water Commissioners, the Corps of Engineers, and the agencies of the Departments of Agriculture, Interior, and Health, Education, and Welfare in developing programs and projects that have appropriate local sponsorships. Their purpose is to promote economic development in cooperating areas.

Each basin water management district promotes the active development of small watershed projects, which are sponsored by local soil conservation and water management districts under Public Law 566. Three basin districts are financing planning parties to develop 12 small watershed projects. They have set up \$495,000 in trust fund agreements for the planning activity, including approximately \$150,000 in the Tombigbee River basin, \$120,000 in the Pearl River basin, and \$225,000 in the Pascagoula River basin (Pat Harrison District).

Sam H. Loftin, Jr., president of the Pat Harrison District, says the district would also help with small watershed projects by defraying legal costs, rights-of-way, and other local obligations. "We have set no limit on our financial assistance to these projects but will base our help on merits and needs in each case."

Small watershed projects

P. T. Lagrone, general manager of the Pearl River Basin Development District, says that the small watershed program is the backbone of basin development, at least in the early stages. The

directors, he said, will push for the development of a small watershed project on Richland Creek to protect an expansion area for the city of Jackson, for projects to reduce sediment and control runoff into the Pearl River Reservoir, and similar measures. They will push, too, for a Corps of Engineers dam above the reservoir.

The general plan is that the river basin water management districts will sponsor and promote Public Law 566 projects with USDA assistance to secure local benefits. When benefits extend beyond the local area, as with a multiple-purpose reservoir providing recreation facilities, the river basin districts will share in the costs.

The Corps of Engineers will cooperate with the river basin districts to build dams and improve channels on the main stream and do other work of direct benefit to large segments of the basin. Agencies of the Departments of Interior and Health, Education, and Welfare cooperate in their fields in any phase of the work.

Comprehensive river basin plans will be of the "open end" variety. The river basin water management districts will coordinate studies by all agencies and develop plans for future action. Objectives for the next 50 years will be set but planning will be in less detail. Plans and action programs will be adjusted according to changing needs over the years.

And most important is the fact that the people have strong organizations with authority and financing to carry out the objectives. ♦

125,000 Rural People Helped by Loan Program

In the first full year of operation, Economic Opportunity loans advanced by the Farmers Home Administration helped nearly 125,000 low-income rural people increase their incomes and raise their standard of living. ♦

RESIDENTS along the Missouri River Valley in western Iowa and eastern Nebraska have a unique problem. Gullies get too big for their bridges.

These people also have a unique answer. Unlike the mother who simply buys a bigger pair of breeches as her son enlarges, these folks girdle their land with erosion control structures.

This program for replacing wornout bridges saves tax money, makes for safer roads, and keeps additional soil from washing down the already muddy Missouri.

Savings in millions

Installing earth dams with drop inlets for bridges is not a new idea. This cooperative venture among county road officials, farmers, and the Soil Conservation Service originated in at least one Nebraska county back in the 1930's. But only recently has the practice spread, as many counties find that it saves money.

Washington County, Nebr., has replaced more than 200 bridges

Drop-Inlet Dams Replace Bridges and Save Millions in Road Costs

with erosion control structures since 1935 saving an estimated \$1 million or more in the process.

Across the river, Shelby County, Iowa, has replaced more than 200 bridges with earth dams and drop inlets since 1951, with an estimated savings upwards of \$3/4 million. Shelby officials found they averaged a reduction of \$4,000 a structure in construction costs alone by using culverts instead of building new bridges.

Other Iowa and Nebraska counties are now adopting the practice. Appanoose and Pottawattamie in Iowa and Saunders and Nemaha in Nebraska are examples reporting favorable results.

In addition to reducing bridge upkeep cost and insuring safer

roads, the drop inlets provide grade stabilization benefits to landowners. Grade stabilization reduces erosion losses and cuts down the number of dams needed in watershed programs.

A problem of loess soils

The problem of deep gullies endangering bridges is largely confined to the highly erodible loess soil areas such as the Iowa-Nebraska region. The problem is accentuated by steep slopes where the terrain dips down to meet the Missouri River valley.

Mill-Long Creek in Washington County, Nebr., for example, drops 200 feet in the final mile before it enters the Missouri River. Gullies in this county just north of Omaha have many overfalls 10 to 50 feet high.

The Mill-Long and Moores Creek watersheds alone had 440 overfalls and 45 miles of gullies. Often a watershed dam and a drop-inlet road structure stand within 100 yards of each other, stabilizing at least 50 feet of grade.

The drop inlets also help sustain water levels in wells. Prior to installation of drop inlets, creek beds eroded deeper with each rain, causing a lower water table and necessitating the deepening of wells. Washington County officials find drop inlets have revived many wells.

Usually the county engineer and an SCS technician drive over the county each fall to determine which old bridges should be replaced by drop inlets the following year. The drop inlets are then designed by SCS personnel to handle the estimated peak flow of a 50-year flood. ♦

Residents of Washington County, Nebr., see a new drop-inlet culvert that will replace the old bridge they are standing on.



District Work Crews Make Jobs as They Heal Land

By **Everett R. Leadbetter**

State Soil Conservationist, SCS, Morgantown, W. Va.

WORK CREWS of West Virginia soil conservation districts provide a direct answer to Appalachia's dual resource problems—the conservation of both human and natural resources.

The crews, employed and supervised by the districts to install conservation practices under contract on the land of cooperators, provide jobs for underemployed local residents while they heal the scars of erosion-damaged lands.

All but one of the 14 districts in West Virginia employ labor crews. They are used mainly for planting trees, shrubs, grasses, and legumes. Last year they employed 397 men for 6,480 man-days of work, for which land owners and operators paid \$192,935. The result was 4,652 acres of trees and shrubs and 447 acres of grasses and legumes planted.

A spreading practice

Shortly after districts were organized, they started employing local workers, mainly as equipment operators and occasionally for tree planting, fencing, and woodland improvement.

The Little Kanawha District in 1955 led the way in demonstrating the advantages of well organized and trained crews whose services could be contracted to landowners. Within a few years other districts were following their lead.

The trend was speeded by an amendment in 1959 to the State's strip-mine law which resulted in districts becoming responsible for

doing most of the revegetation work on strip-mine spoils, a major job in all but three of the State's districts.

Last year this work resulted in employment for more than 70 workers each in three districts. The Little Kanawha District, with no strip-mine spoil, still had work during the height of the planting season for 60 men. This district has found also that a small labor force employed year-round is feasible and a valuable aid to conservation work.

Luther Britton, supervisor in the Monongahela Soil Conservation District and president of the State Supervisor's Association, has supervised a planting crew for about 10 years.

He says, "I like a crew of 8 or 10 for planting trees. On strip-

mine spoil the planting goes a little slower, but they still plant 600 to 700 trees per man-day and occasionally as many as 1,000. When using these trained planting crews we generally get a better quality job than the land owner would do for himself."

Technical supervision

Crews are trained by and receive limited supervision from technicians of the Soil Conservation Service and the State Department of Natural Resources.

Many district supervisors, in addition to recruiting and scheduling the crews, find time to check on progress of the work.

Land owners and operators are informed of the services available through their district by the SCS conservationist at the time the plan is being made. When a co-operator desires services he contracts for them with the district supervisors.

Some districts now provide complete planting services. They buy, transport, and care for the planting stock. They see that the job is properly done before presenting the statement for payment. Such a package deal is especially advantageous to the absentee landowner and to those employed full time with off-farm work.

District employees use the district's equipment to plant trees on graded strip-mine spoil in the West Fork SCD, W. Va.



SCS Soil Conservationist Maurice Allman (below) tests strip-mine spoil for acidity in planning for revegetation. Then a small planting crew (r.) plants trees under supervision of the district.



The conversion of exposed strip-mine spoil to a shady grove follows quickly after a quality planting job by a trained crew. This black locust stand is 5 years old.



Plantings by other than district crews have remained fairly constant, while the volume of planting by district crews has shown a gradual increase for several years. Last spring, district crews planted more than three times as many trees and shrubs as were planted by all others on the land of cooperators.

Prospects seem good that the trend in use of labor crews will continue. Supervisor Luther Britton says these are men who need the work and that the districts need them. It's the only way the planting job can be accomplished. ♦

Manty-Harju Is Woodland Mecca

AN IDYLIC-SOUNDING mecca by the name of Manty-Harju near Placerville, Calif., is visited each year by hundreds of folks of Finnish forebears who enjoy the traditional sauna bath plus the hospitality of Mr. and Mrs. Arthur Kylander.

Manty-Harju means "pine ridge" in Finnish. In California, it means a tree farm which has become a model for woodland conservationists the world over.

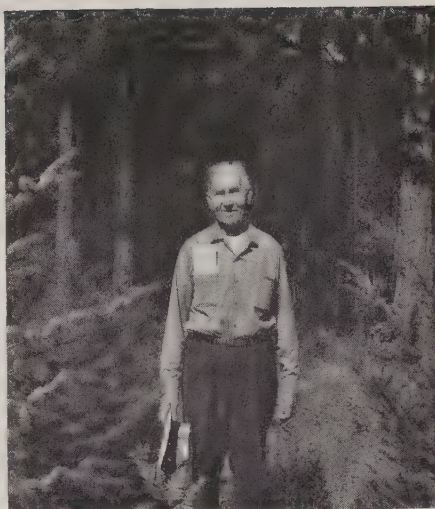
Kylander, 73, migrated from his native Finland to America at 22, worked his way as woodsman and carpenter from Maine, New York, Pennsylvania, Ohio, Minnesota, and finally to California. There he and his wife, Julia, invested their savings in a tree farm which they named Manty-Harju.

Kylander's interest and ability in silviculture and woodland conservation began in the forests of Finland where he played and gathered firewood as a boy. When he acquired Manty-Harju, he became a cooperator with the El Dorado Soil Conservation District and was assisted by the Soil Conservation Service in developing a woodland conservation plan. His first cutting of merchantable timber for immediate income and to give younger trees growing space netted 2 million board feet which sold for \$3 a thousand.

The woodland conservation plan also called for removing shrubs, unmerchantable trees, and less desirable species to improve the stand. All wood products were salvaged, the firewood being sold to homeowners and the local hospital and posts and poles to the State fair.

Rough lumber brought more profit than saw logs, so Kylander built a one-man sawmill which has produced about a million board feet of lumber.

Kylander used some of the lum-



Arthur A. Kylander and some of the Douglas fir Christmas trees he planted in 1959. In the background are pruned Ponderosa pines.

ber to build his home, garage, three guest cabins, outside cook-house and a large sauna bath—"no self-respecting Finn would be without one."

Managed harvesting, thinning, pruning, land clearing, tree planting, and firebreak construction were among the woodland conservation practices applied by this tree farmer. He also installed an irrigation system for 22 acres of Christmas trees.

"This type of work is the secret of staying young," said Kylander.

It's the secret also of the kind of respect that won for him the Goodyear Tire and Rubber Company "Outstanding Conservation Farmer of the Year" award in El Dorado County SCD in 1964.—

CHARLES E. MATSON, *Work Unit Conservationist, SCS, Placerville, Calif.* ♦

Greenspan to Help Preserve Open Space

A new "Greenspan" operation of the Cropland Adjustment Program offers cities, counties, and State Governments opportunities to acquire farmland for use as open space and parks.

Grants are available through the program to enable local governments to increase the permanent retirement of cropland to such

noncrop uses as preservation of open spaces, natural beauty, the development of wildlife and recreational facilities, and the prevention of air and water pollution.

Greenspan grants may be used for the acquisition of land and for conservation work on the land. Such grants will not exceed amounts that could be paid on the same land through the Cropland Adjustment Program. ♦

Watershed Forum Reviews Progress

"New Tests in America's River Basins" is the theme of the 13th National Watershed Congress in Oklahoma City, May 15 to 18.

The National Watershed Congress, sponsored by more than 20 of the Nation's leading industrial, agricultural, and conservation organizations, is dedicated to improving natural resource management and use. The yearly meetings afford an overall review and discussion of watershed programs, problems, and progress.

The proceedings contain papers of professional and nonprofessional leaders dedicated to improving the water wealth of the Nation.

One of the highlights of the annual meeting is the presentation of two awards to the Watershed of the Year and the Watershed Man of the Year.

Three basic standards are used in selecting the Watershed of the Year:

(1) The extent of interest and participation by all agencies and groups within the watershed, (2) adequacy of the project in meeting all of the natural resource conservation and improvement needs of the watershed, and (3) present status of completion of the project.

The Watershed Man of the Year award is made, on the basis of nominations submitted to the Awards Selection Committee, to an individual who has made outstanding contributions to the progress of watershed programs. ♦

Crisis in the Countryside

Theme of Soil Stewardship Week 1966

Each spring, thousands of clergymen and their congregations in the 3,000 conservation districts throughout the country observe Soil Stewardship Week as a time for special attention to the moral obligations and responsibilities all of us should accept for the conservation of natural resources. An increasing number of farm, civic, and other organizations are including time in their programs for recognition of these responsibilities.

An advisory committee composed of leading clergymen representing several church denominations each year meets with the National Association of Soil and Water Conservation Districts to select a timely theme for the annual observance. Each theme, enlarged in booklet form, is designed to empha-

size that the basic motivation for conservation and orderly development of natural resources is man's recognition of his responsibility under God to protect and use wisely His precious gifts of soil and water.

The material that follows is excerpted from the booklet entitled "Crisis in the Countryside," which was developed by this advisory committee and distributed by NACD for use during 1966 Soil Stewardship Week, May 15-22. We believe the theme is particularly timely because it focuses attention on current forces and trends which can have a lasting influence, for good or bad, on that vast part of America lying between its cities.

—GORDON K. ZIMMERMAN, Executive Secretary, NACD.

SOIL STEWARDSHIP lives in the spirit of a responsible people at work on the land. As never before, this spirit is being tested and the work is becoming more critical. The reasons lie in the rapidly changing character and goals of our country.

The land in-between

We have become, predominantly, a nation of city-dwellers. Each day and each year, more and still more Americans concentrate in the towns, cities, and suburbs. To them, life is centered there. . .

What, now, happens to the countryside? Never have so many Americans known so little about it. Increasingly, it becomes a kind of obstacle in time and space separating cities—the vaguely identified "land in-between"

which must be crossed quickly by highways, trains, and planes.

Among the new and city-oriented generations, there is danger that the land in-between will be regarded increasingly as mere "undeveloped" space. In their preoccupation with urban and user needs, there is risk that a majority of Americans will lose sight of the vital functions of the countryside and depreciate the necessity of soil stewardship.

The price of plenty

The evidence of present plenty in the bulging supermarkets and shopping centers of the country dulls the sharp edge of urgency in the call for soil stewardship—for the conservation, wise use, multiple use, and orderly development of vital soil and water resources. The land is the source of our ample food supply and since there is anything but a shortage of food, why worry about the land? . . .

The supermarkets are still full. Widespread public indifference

toward resource management is a price we pay for present plenty. It is also a root cause of the impending resource crisis in the countryside.

Distortion of values

Headlong expansion, spurred by mammoth economic growth, sustained industrialization, and the material demands of our rising population, carries with it the simultaneous perils of waste, mediocrity, and the emergence of false shrines. Nowhere is the jeopardy greater, and the responsibility of soil stewardship correspondingly larger, than in the American countryside.

We find ourselves in an age demanding instant satisfaction of ill-considered demands—often hypocritically made in the name of progress and society. Irreplaceable vistas of unique natural beauty give way to the vast growth of highways most notable for the density and offensive taste of the signs and structures which constrict their edges. Motor oil and

The Soil Stewardship Advisory Committee for 1966 is composed of the Reverend E. W. Mueller, D. D., of the National Lutheran Council; The Right Reverend John George Weber of the National Catholic Rural Life Conference; the Reverend Lewis W. Newman, D. R. E., of the Southern Baptist Convention; the Reverend Harold S. Huff of the National Council of the Churches of Christ in the U.S.A.; and the Reverend Henry McCanna, D. R. E., of the National Council of the Churches of Christ in the U.S.A.

gas defile once-clear mountain lakes just as the excretion of our cities is allowed to pollute our rivers. Housing pushes outward rank on rank without a breath of green space. And some of the most fertile farmland in the world is sacrificed to the onslaught of factories and asphalt-covered shopping centers, which presumably could be located nowhere else.

Growth itself is not the culprit, for growth in constructive works and development of a fruitful environment for man are surely to be encouraged and praised. It is the indiscriminate use of our God-given resources, the distortion and failure to recognize relative values, that invite and deserve censure. . .

The countryside is the great inland reservoir of nature. It deserves care and protection against the exploitation and miscalculation of values which now contribute to the crisis in the countryside.

Breaking the farm barrier

. . . More than agriculture is at stake in the countryside.

The quality of water management in the countryside, for example, has consequences far beyond farm production. It bears upon flood prevention, water supply, navigation, and power. It affects fish, game, and wildlife. It can be a vital factor in local economic growth, pollution abatement, and recreational development.

The benefits of soil stewardship go well beyond farmers. Responsible stewardship, in its broadening performance, involves more than protection of land against damage. It extends to the enhancement of natural beauty in the countryside, to outdoor recreation, forestation, and the reclamation of wastelands. It involves the careful allocation of lands to multiple uses, in a range including timber production and water storage, housing and highways, grazing and nature trails, crop production and wildlife. . .

The pressures on leadership

No one can yet forecast the full dimensions of the changes now under way in agriculture and across the countryside of America. Enough is already apparent, however, to indicate they are vast and carry with them the seeds of new attitudes, new social and economic arrangements.

The transition under way on all sides imposes new tests on soil stewardship; it cries out for the assertion of leadership by those who take seriously their responsibilities to God for the soil, water, and other resources entrusted to us.

The needs are more than evident. There is need to re-identify the resource assets of each community, county, and conservation district—project the probable demands that will be made on these resources—and guide the development and use of these same resources along wise and orderly lines.

There is need to develop a countryside purpose—to identify the principles and goals of the countryside and make them known. There is need for leadership to spell out basic values which must be considered and conserved. There is need to re-assert Man's everlasting responsibilities for stewardship under God.

There is need for leadership in the church, in conservation districts, in farm organizations and chambers of commerce—among conservationists, tradesmen, bankers, and newsmen—to identify the array of new issues now facing the countryside and the soil, and devise constructive programs for dealing with them.

Facing the crisis

If ever there was a time for the resurgence of a spirit of soil stewardship, it is now. The tide of demand for land and water is running high—and will rise higher. Acquisition is the goal and the transactions multiply.

The land is limited. It is fixed in place, fixed in amount, and it must be used where it is. Only the uses and conservation (or lack of it) are ours to dispose. We can use land for farming or factories, housing or wildlife, highways or forests, and so on. We can decide to use it wisely or otherwise. The choice is ours, if we will exercise it rationally under God, to make it yield a full range of desirable soil and economic products at the right time and from the right place—without impairment of the resource itself.

A time for speaking

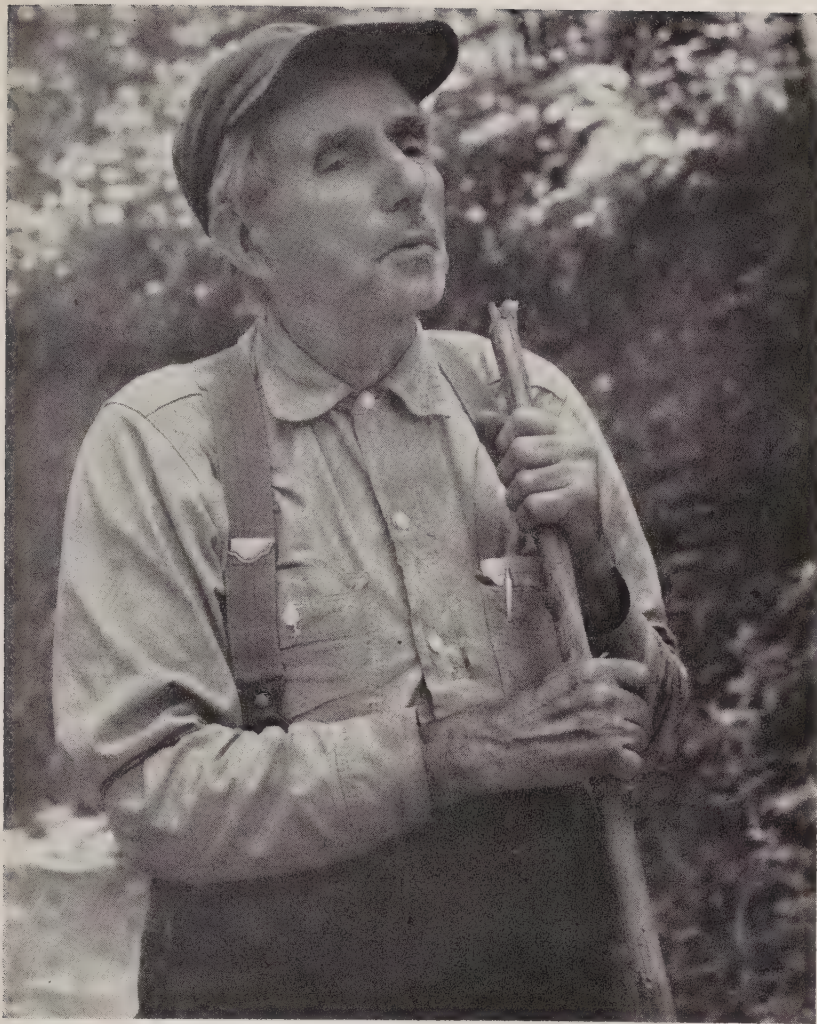
Silence is golden, according to an old maxim, but in a time of crisis it can also be costly. When vital issues are at stake, silence denies democracy and invites oppression. It can signify fear or cowardice, but more often it signals a man of little faith and less conviction.

This is a time to speak for the unity of the countryside in all its values and uses. It is a time to advocate the protection and development of our resources as a whole, in accordance with their capabilities and the community's goals. It is a time to speak for action that will meet the oncoming demands of our growing society—and forestall premature and disorderly commitments of resource use.

The present crisis in the countryside is a time for speaking. It is a time, for all those who genuinely believe in the values of conservation and in the obligations of man to God for stewardship of His natural resources, to come forward and be heard. ♦

New Conservation Agreements

Eleven States and one territory are now covered by modernized conservation agreements with USDA. They are: Arkansas, Connecticut, Louisiana, Maine, New York, North Dakota, Ohio, Rhode Island, South Carolina, Vermont, Wisconsin, and Puerto Rico. ♦



Never too Old for Conservation

WHY would an elderly man want to do woodland improvement work from which he will never benefit?

That's the question people might ask J. N. Buchanan, the oldest active cooperator with Ohio's Guernsey Soil and Water Conservation District.

At the age of 97, Mr. Buchanan is working diligently to leave his woodland in a productive state for future generations. He believes that a good woodland is an asset to any farm. He knows that wise land use demands that the steeper slopes and draws be maintained in forest trees.

"I expect to receive few, if any, financial benefits from my efforts in the woods," Mr. Buchanan says. "We landowners must preserve the natural resources of our farms

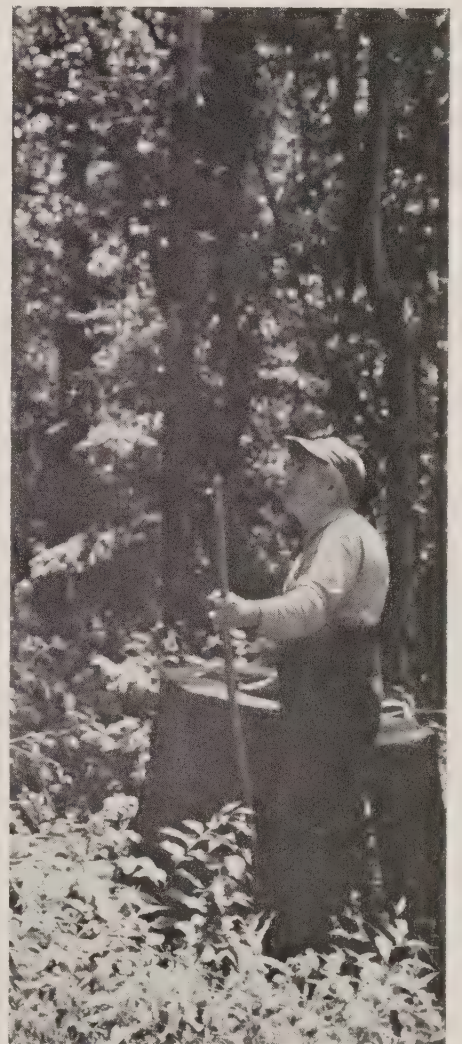
and leave them to the next generation in better condition than we received them.

"There is much personal satisfaction in producing a good woods and knowing that greater returns will be realized in the future. We never get too old to contribute to the conservation of our natural resources."

Buchanan was born in December 1869 on a farm near the Ohio River in West Virginia. At the age of 11, after the death of his mother, he went to live with a farm family in Missouri, where he stayed and worked until he was 20 years old.

The next 20 years he worked as a railroader for various railroads

Mr. Buchanan stands beside the stump of a large beech that was removed to make room for younger trees to grow.



throughout the United States. In 1906 he purchased a farm in Licking County, Ohio, on which he ran a dairy until 1924. Since that time he has owned and operated several grocery stores and filling stations.

In 1950 he purchased a 100-acre bottom-land farm in Guernsey County near the city of Cambridge. He immediately became a cooperator with the Guernsey District. He says, "I often think how much better job I could have done on my farm in Licking County if the Soil Conservation Service had been available to give me technical assistance."

In 1963 he bought the first 72 acres of a second farm in Guernsey County and sold the bottom-land farm. He soon added an adjoining 100 acres. Both tracts had been badly neglected and were grown up to a jungle of thorn bushes and elms.

As each farm was purchased a cooperative agreement was signed with the district and a conservation plan developed. Corn and small grain were grown in rotation on the bottom lands. Second bottoms and the hill land that could be worked safely with a tractor were cleared and established in good pastures and meadows. This left the steeper slopes and rougher land to be maintained in existing woods or planted anew.

Mr. Buchanan not only practices good land use but uses necessary conservation measures. The year 1966 will see the last of the pastures treated and meadows established.

Mr. Buchanan is improving his woods at the rate of about 10 acres each year. He hires a man to do most of the work but is in the woods himself helping with the job almost every day.

Two of the three woodland areas have been fenced against livestock. The third will be fenced in 1966.—GEORGE W. EIKENBERRY, *Work Unit Conservationist, SCS, Cambridge, Ohio.* ♦

Nursery Adds a Touch of Beauty



Bill Jung and the author inspect an array of chrysanthemums planted on the contour and protected by a diversion.

A COMMERCIAL nursery is a beautiful thing when flowers are in bloom, but one whose owners are conservation minded is a breathtaking sight.

On the Jung Seed Company farms in Randolph, Wis., many-colored chrysanthemums, bright in the late summer sun and growing in gently curving contour rows, add unusual beauty to the countryside. Peonies bloom in early June, and their colors accentuate the rows planted parallel to a diversion that protects the sloping land on which they grow. Irises, flowering on terraced land, attest to the importance attached to conservation farming by the seed company.

Until 1955, erosion from heavy rains was a problem. The runaway topsoil covered low-lying fields, ruining valuable crops. It filled a road ditch and coated the road, causing a driving hazard until removed by highway maintenance crews.

Gullies began to appear, and 3- to 4-foot-deep eroded draws could not be crossed with farm machinery.

But in 1955 the seed company

management, as cooperators with the Columbia County Soil and Water Conservation District, began a field-by-field and farm-by-farm attack on erosion.

Ten acres of grass waterways were shaped and seeded; one waterway having an 800-acre drainage area was stabilized at the outlet with a concrete drop-spillway structure. Seven miles of terraces were planned and built to permit the intensive cultivation necessary in nursery and seed corn farming. Some 4,500 feet of diversions were built to protect previously wet pockets. Shelter belts are planned to protect the crops from wind erosion on light soils.

Today the fields are uniform in productivity. Crops mature evenly, an important factor in any kind of farming, but especially so in commercial seed production.

And they know that good stewardship of their land is helping them supply customers with quality seeds and plants and a generous helping of rural beauty.—WARREN J. FITZGERALD, *Work Unit Conservationist, SCS, Portage, Wis.* ♦

Sam's Lake

Watershed dam gives farmer something to share with neighbors

SAM SOWELL owns a watershed lake. That is, he owns the land where the dam was built and has control of the water in the normal pool.

When the Upper West Red River Soil and Water Conservation District and the Natchitoches Parish Police Jury in Louisiana asked for easements for the Bayou Dupont watershed, Mr. Sowell was the only landowner who came in voluntarily and asked to sign. Now damsite No. 9 is on his land, and he has a 15-acre lake behind it.

But that's only part of what Sam Sowell has. He has neighbors, who come to fish in his lake. "They help me with my cotton chopping and picking, and I let them fish," he says. He charges no fee.

Since 1959, when the dam was built, he has had five baptizings. Both white and Negro churches



Sam Sowell's neighbors gather to hear SCS Work Unit Conservationist J. L. Holdman explain the purpose and function of a watershed structure. Groups have also gathered there for picnics and baptizings.

use the lake. He is proud of that record.

School groups visit Sam's lake, learning about watersheds, flood prevention, and conservation of natural resources. Because of the good maintenance job the district and the police jury have done, it makes a beautiful outdoor laboratory.

Above the dam Sam has crimson clover and common bermudagrass for extra grazing for his 22-cow herd. He has renovated 64 acres of pasture to get better protection for the land and better grazing. He has weeded out the culls in 22 acres of woodland and has a good stand of desirable trees. He plants cover and green manure crops on cultivated fields.

Now hear what Sam Sowell doesn't have.

He doesn't have any floods at all on his good, level land along Brushy Bayou. From the time he put in his first crop in 1917, old Brushy had flooded every winter. Once out of every 4 years, it would take away his crop. But no more.

There is no more scouring of topsoil, forcing him to plow again to get up enough loose soil for a



The landowner, Sam Sowell (I.), tells M. E. Winn, supervisor of the Upper West Red River District, how "his" lake is used for recreation and livestock water.

seedbed. No more planting over, sometimes twice.

He didn't have 5 or 6 feet of water over his bottom lands after a 15-inch rain in September 1961. That storm didn't even put water through the emergency spillway; it stayed behind the dam and quietly waited its turn to get out. Years ago he would have had to swim down his cotton row, if he had any reason to go at all. When the water went down he would have had sediment covering the stalks and lint, if any.

Sowell has been cooperating with the Upper West Red River District on his 140-acre farm since 1954. At age 71 he walks over his fields with a cane and opens the gate instead of jumping the fence, but there is a freshness of understanding in his story of floods and crop losses that he once had but is now free from. His son, Amshell, who lives up the road, does the farming now.

Lee Holdman, for many years SCS work unit conservationist serving the upper West Red River District (now area conservationist, Denham Springs, La.), visited Sam regularly to help him with his conservation work and to pull an "eyeball inspection" of site 9. "His enthusiasm always brightened my day," says Lee.

Sam has given some thought to charging a fishing fee to compensate him for the loss of income from the land in the lake. "But I don't miss the land, and I like my neighbors to enjoy it, too," he says. He figures the flood prevention has already paid him—many times.—JOHN M. CROSS, *Assistant to the State Conservationist, SCS, Alexandria, La.* ♦

Water Quality

Water of acceptable chemical quality is water that requires no treatment before use or water from which dissolved minerals can be removed by economically feasible water-treatment methods. ♦

Conservation Challenges

By D. A. Williams

IN CASTING ABOUT for the right words to use in suggesting the significance and timeliness of this First Pan American Soil Conservation Congress, I came upon a paper by Dr. F. Fraser Darling, a distinguished British conservationist known by many of us here. Dr. Darling has written:

"Conservation is reaching forth to a larger concept than caring in an earnest but rather hazy way for animal species, for forests, soils or fresh waters; it is becoming the care of the human habitat, which is the whole planet."

Let me repeat the key words of that passage:

"Conservation is reaching forth to a larger concept . . . it is becoming the care of the human habitat, which is the whole planet."

That indeed is why we are here—or why we should be here.

—Not because poor soils yield poor crops but because poor soils make poor people.

—Not because of what soil erosion does to land but because of what it does to men, women, and children, in our crowded cities as well as in our developing rural areas.

—Not because of what fire or flood can do to the beauty and productivity of the forest or valley but because of what they can do to hope and dignity of human beings who live and work there.

—Not because we need a vanishing species of wildlife for its meat or feathers, but because we have no right to deprive future generations of any of the fullness of the world as God created it.

—Not because we seek some ethereal harmony between man and Nature, but because we seek peace

between man and man—a peace that rests in large measure upon the conservation and development of soil and water resources from which people draw their sustenance in every part of the world. . .

* * *

The term "soil conservation" has come to signify those combinations of skills and practices needed to develop and sustain the productivity of each kind of soil for whatever purpose it is used—whether that use is for crops, for forest, for recreation, or for housing.

Soil conservation means choosing the appropriate use for each piece of land as well as protecting and improving the land after the use has been chosen.

Soil conservation means the careful planning and treatment of entire operating units, be they farms or ranches or entire watersheds.

Soil conservation means working out land use and treatment in full recognition of the essential relationships between soil, water, plants, animals, and—yes—man himself.

The greatest danger, as conservation technology advances, is that we may fail to involve the human element. (Remember Dr. Darling's allusion to the "human habitat.") Conservation must be *people-centered*. It must not only be carried out *for* people. It must be carried out *by* people.

To be fully effective, conservation decisions must always be made by the people who will be responsible for carrying them out. Conservation will never be accomplished by edict. Government can and must be an active partner, but should do for people only what they cannot do for themselves.

From remarks before the First Pan American Soil Conservation Congress in Sao Paulo, Brazil, April 12, 1966.

Conservation *will* move forward if it is viewed and accepted by land owners and operators as a means of making more efficient use of their soils, with higher yields per acre or hectare, with lower costs per kilo or ton, with better net income for the farmer or rancher.

It *will* go forward if city people are made partners, if they are helped to see their stake in soil and water resources, and if they are invited to work with rural people in soil and water conservation endeavors.

Rural and urban people both benefit from accelerated soil and water conservation programs. With better income, farmers can not only afford better education and medical care but can purchase more of the products and services offered by urban people. Urban water supplies are improved, flood threats diminished, and the entire community, and thus the Nation, benefits and prospers.

* * *

It seems to me that two great challenges emerge to conservationists in this changing world:

(1) To seek out diligently and utilize the best and most advanced technology available to adjust resource use to the mounting demands of population growth and rising living standards.

(2) To educate our people—all our people—in the principles of resource conservation so that they can and will act and exert leadership as informed citizens.

Let us hope that out of this Congress will come other challenges and specific proposals for action within and between our nations.

Is it too much to expect that we might, for example, look forward to a greatly accelerated flow of information between technicians and scientists in specific subject matter fields?

Is it possible that we may find opportunities for further exchanges of technicians and scientists, so

that we share to the maximum the experiences of each country?

Could we look toward the formation of international councils or panels that would carry forward, on a permanent basis, the continuing review of hemispheric conservation needs and problems which we have begun to explore at this Congress?

Could there come from this Congress a nonpolitical manifesto that would assert the resolve of our nations to work together with new determination in the development of the science and art of good land use for the benefit of all people, here in this hemisphere and throughout the world?

I know that my fellow conservationists from the United States join me in expressing our deep appreciation to the sponsors and planners of this great Congress. We pledge to you all the cooperation that lies within our power to achieve our mutual goals.

It is in your hands and mine to carry forward action that could spell survival or destruction of the human race.

It is *that* important! ♦



Careers in Natural Resource Conservation. By FRED W. HERBERT. 1965. *Henry Z. Walck, Inc., New York.* 110 pages, illus. \$3.75.

Written by one whose 46-year career was spent in the field of natural resource conservation, this book provides for high school students as well as guidance counselors some valuable insights into seven career areas—soil science, agronomy, range conservation, conservation forestry, conservation biology, conservation engineering, and soil conservation. Interwoven into the broad general descriptions of the work of professionals in

these fields is a good deal of basic information about soil and water conservation.

Herbert, until recently assistant State conservationist for SCS in California, has limited his discussion mainly to careers with Federal agencies, especially the Soil Conservation Service. Opportunities with private industry and State agencies are briefly mentioned.

One chapter is devoted to qualifications for a career in conservation. It explains Civil Service requirements and gives salary ranges in the various Federal General Schedule grades. The very brief chapter entitled "Conservation Aids and Technicians" provides useful information for those who do not have a college education.—WALTER E. JESKE, *Information Division, SCS.*

The Geography of Soils. By BRIAN T. BUNTING. 1965. *Aldine Publishing Company, Chicago.* 213 pp., illus. \$5.

In this compact book, an American publisher has given us a British professor's description of the soils of the world and a synthesis of major concepts regarding their morphology, classification, and distribution.

The author is lecturer in geography at the University of London. His concern is not with the management and use of soils but with their character and distribution as they occur in nature, undisturbed or under the use of man. The numerous literature citations with each chapter show that he has made a thorough and discriminating study of the world literature of the subject.

The book—each chapter, paragraph, and sentence—is logically organized and simply constructed, although heavily laden with technical data and terms. The result is a useful introduction to the subject for the technician who is not a soil scientist and for the general reader who is willing to consult a dictionary when he needs it.—B.O.

New Publications

Water in Industry. BY NATIONAL ASSOCIATION OF MANUFACTURERS AND CHAMBER OF COMMERCE OF THE UNITED STATES. 1965. *New York and Washington*. 81 pp., illus. \$2. This booklet supersedes one by the same title published in 1950 presenting results of a survey conducted by the National Association of Manufacturers and the Conservation Foundation.

Here we have new data on the use of water by industry resulting from a new survey by the NAM, chamber of commerce, and 22 industrial and trade organizations acting in cooperation with the National Technical Task Committee on Industrial Waters.

Not only are new and more elaborate data provided, but they are interpreted in relation to the national water situation. Citizens, conservationists, and water use planners will find the industry viewpoint informative and stimulating. The warnings against glib and unthinking use of figures are well taken, and apply to the entire subject of water supply and use with as much force as to data on industrial use.

The following comment on a much-quoted statistic is representative:

"It takes 17,000 or 32,000 or 65,000 gallons of water to make a ton of finished steel, depending upon which author you happen to be reading. The numbers for a gallon of gasoline run from 7 to 70 gallons. . .

"While unit figures are plentiful, reliable ones are not. The 'usage' for steel is most commonly cited as 65,000 gallons per ton; this survey reports the withdrawal as less than one-third that amount.

"Such discrepancies have varied origins. 'Guestimates' of years long past are still being quoted. Improved conservation practices have cut withdrawals. Recirculation instead of withdrawal quantities may be quoted through a misunderstanding of the distinction, or broad conclusions drawn from a few nontypical figures."

Likewise, the hazards of using national averages are likened to the story of the statistician who "drowned while wading across a river whose average depth he had computed as 2.16 feet."

The industry report argues strongly for constant questioning of the uncertain figures on water resources, including those in the current report.—B.O.

Land Resource Regions and Major Land Resource Areas of the United States. BY MORRIS E. AUSTIN. 1965. *USDA Agr. Hdbk. 296*. 88 pp., map in pocket. (\$1.00)

The handbook provides the first published description of the generalized soil areas and land resource regions of the United States.

The map is an updating, revision, and redesigning of the 1950 map, "Problem Areas in Soil Conservation," prepared by the Soil Conservation Service. It delineates 156 major land resource areas based primarily on general soil maps (or soil association maps) but characterized also by climate, water resources, land uses, and type of farming. They make use of information from soil surveys and other sources available through 1964.

The areas are grouped into 21 land resource regions based on relationships significant to agriculture and resource conservation. Some of the regional boundaries cut across basic physiographic divisions usually used to characterize natural landscape features.

Following a brief generalized description of each region, its component areas are described as to land use, elevation and topography, climate, water, and soil. These descriptions, previously unpublished, comprise the major content of the book.

The Effect of Soils and Fertilizers on the Nutritional Quality of Plants. BY U. S. PLANT, SOIL, AND NUTRITION LABORATORY STAFF. 1965. *USDA Agr. Inf. Bul. 299*. 24 pp., illus.

A summary report compiled by the staff of the Plant, Soil, and Nutrition Laboratory, Agricultural Research Service, Ithaca, N. Y., answers, on the basis of present knowledge, the recurring question of how the quality of soils affects the quality of food and feed grown on them.

"As far as the people of the United States are concerned," the publication says, "our varied diet, composed of animal products, fish, plants, and plant products, originating in different parts of the country, makes it very unlikely that the deficiencies of any one kind of soil will have an adverse effect on human nutrition. Our farm animals, however, are sometimes largely fed on just a few plant species, grown on just a few kinds of soil, so noticeable effects of the soil upon the nutrition of farm animals are more common."

The report discusses in some detail a number of aspects of this very complicated question.

Indians of North Carolina. BY BUREAU OF INDIAN AFFAIRS. 1965. *U. S. Dept. of Int.* 12 pp., illus. \$0.15. The story of the Cherokees and their exodus to Oklahoma is followed by a description of the life today of those remaining in and around the Cherokee Reservation in North Carolina.

White and Nonwhite Owners of Rural Land in the Southeast. BY ROBERT F. BOXLEY, JR. 1965. *USDA Econ. Res. Serv. ERS 238*. 23 pp., illus. Information based on data from survey to determine the patterns of rural land-ownership in Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, and Virginia.

Flow Resistance in Simulated Irrigation Borders and Furrows. BY AGRICULTURAL RESEARCH SERVICE. 1965. *USDA Cons. Res. Rpt. 3*. 56 pp., illus. Technical report of results of hydraulic laboratory studies "to develop the relations necessary for predicting resistance to flow in irrigation borders and furrows without trial resistance runs."

The Demand and Price Situation for Forest Products.—1965. BY DWIGHT HAIR AND ALICE H. ULRICH. 1965. *USDA Misc. Pub. 1009*. 43 pp., charts.

New Product Development for Economic Growth in Rural Areas. BY AGRICULTURAL RESEARCH SERVICE. 1965. *USDA Misc. Pub. 1031*. 11 pp.

Soil Surveys

Prineville Area, Oregon. BY R. W. MAYKO AND GEORGE K. SMITH. 1966. 89 pp., illus.; maps 3.17 inches to the mile (1:20,000). Fieldwork by George K. Smith and Harold Biggerstaff, SCS, and Elwood Dull, Oregon Agricultural Experiment Station.

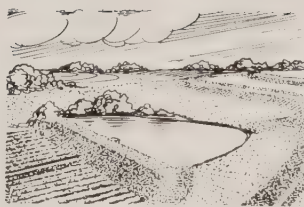
Marlboro County, South Carolina. BY RICHARD W. CRAFT, JR. 1965. 109 pp., illus.; maps 3.17 inches to the mile (1:20,000). Fieldwork by Richard W. Craft, Jr., W. L. Colburn, F. L. Green, C. B. Lawrence, J. J. Pitts, T. R. Gerald, and W. J. Camp.

Grand Traverse County, Michigan. BY HERMAN L. WEBER, ROBERT HALL, NELS R. BENSON, AND G. VAN WINTER. 1966. 141 pp., illus.; maps 4 inches to the mile (1:15,840).

Crosby County, Texas. BY WILLIAM M. KOOS, LEE A. PUTNAM, AND WAYBURN D. MITCHELL. 1966. 70 pp., illus.; maps 3.17 inches to the mile (1:20,000).

From the Administrator:

Model for Rural Development



WE ARE especially pleased with the continuing upward trend in the number of multiple-purpose watershed projects being planned and placed under construction under Public Law 566. These projects are serving as the catalyst for an acceleration in community development in many rural and small town areas and even in some urban situations.

Of the 712 projects approved for operations as of January 1, 346 or 49 percent were multi-purpose. That is, they included purposes other than watershed protection and flood prevention; namely, agricultural water management, recreation, municipal and industrial water supply, or fish and wildlife habitat improvement.

In contrast, as of January 1, 1960, only 30 percent, or 63 out of a total of 212 projects in operation, were multi-purpose.

Some of the reasons for the increase in multi-purpose developments may be of interest.

The problems that need solution in small watershed communities are as diverse as the landscape of America. In some areas the major problem is flooding; in others drainage; in some, the need is for improved irrigation; in still others, there is increasing need for recreation facilities, municipal and industrial water supply, fish and wildlife improvement, or some other improvement in the use of water resources.

These are problems that usually cannot be solved by individuals working alone. They require joint action under a common plan with some form of cooperative local initiative and leadership. To this must be added some form of State and Federal aid, to the extent required, to supplement local re-

sources in carrying out planned improvements.

Small watershed projects offer an opportunity to interrelate land treatment and structural measures for any of the desired water management objectives. Such a diversified approach can serve the needs of almost any small watershed community. This multi-purpose possibility is, no doubt, a major factor in the widespread interest that has stimulated the phenomenal growth of the program.

So it is that the small watershed program offers a practical approach to revitalizing rural communities. It is based on complete utilization of available resources, including natural, human, financial, and technical. Organized local groups, with representation from varied interest groups and a desire for community improvement, can use the multiple services available to build an improved economy for their people.

These projects serve both town and country people. Many small towns in rural areas have critical needs for flood prevention, new recreation facilities, and additional municipal and industrial water supplies. Many small towns are taking advantage of the opportunity afforded by Public Law 566 projects to obtain these improvements.

A new water supply can change the economy of a community by bringing in new businesses or expanding old ones, inevitably leading to more jobs and a general expansion of the economy.

Recreational developments are proving to be most popular in many small watershed projects in rural communities. As of January 1 of this year 93 projects had included recreation as a part of their

multi-purpose developments.

Striking income gains for a community also result from recreational developments. Many types of related business enterprises, such as motels, restaurants, retail outlets for boats, fishing supplies, and other merchandise often follow these community developments.

More and more attention is being given by watershed project sponsors to the potential opportunities for enhancing and developing fish and wildlife resources as a part of multi-purpose developments. A joint task force of the U. S. Departments of Interior and Agriculture is providing valuable encouragement and assistance to local sponsors in developing plans for desirable fish and wildlife improvements in small watershed projects.

Basic to all watershed projects, of course, is appropriate conservation treatment of the land in the watershed area. We must not lose sight of the fact that the *first* purpose is *watershed* protection.

Land use adjustments from cropland to other uses are a fundamental need in many projects. Such adjustments, coupled with needed conservation practices, aid in achieving the needed hydrologic and sediment-reduction effects. In turn, the community benefits from improved water quality as a result of the reduction in sediment pollution.

The multiple-purpose approach in the small watershed program is an important part of the Department of Agriculture's effort to help rural people improve their environment. The primary objective is better living for people in the country, both farm and non-farm. The small watershed program, having already proved itself in all sections of the country, offers a practical model for the more ambitious efforts now being initiated by the Department to bring coordinated community development to all of rural America.

D. A. WILLIAMS



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Road Dams Stop Erosion and Enhance Beauty Story on Page 227



Small lakes like this dot watersheds in the loess soil areas of Nebraska and Iowa where drop-inlet structures are rapidly re-

placing bridges across the many gullies that cut the countryside.

The structures stabilize the grades in once-active gullies and

enable farmers to establish successful erosion control on watershed lands. They also save tax money by reducing highway costs.

Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES

1.6 SO3S
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Income Recreation

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SOIL
CONSERVATION
SERVICE

U. S. DEPARTMENT
OF AGRICULTURE



Recreation . . .

Case history after case history proves that farm and ranch land *can* be converted to recreation use with pleasure to the user and profit to the owner.

SCS fieldmen this month give us a far-flung sampling of experiences that vindicate USDA's faith in private enterprise to meet changing needs in land use.

We could publish in this issue only a few of the accounts submitted: WUC Ray Borchard's story of a shooting preserve-ranch operation in California (p. 247); WUC Edwin Engle on a ranch-campground in Colorado (p. 248); and Technician Leo Clark on a recreation farm in Ohio (p. 257).

Cleanup: Meantime, a Kentucky community demonstrates how local initiative, aided by technical and other assistance, can brighten and enliven the rural environment. SCS Work Unit Conservationist Luther Gabbard gives us the story (p. 251).

Erosion-Sediment: Erosion, as has been said before, is a two-edged sword. It damages where soil is removed, and again where it comes to rest.

Geologist Stanley Murdock reports on erosion-sediment studies in Indiana (p. 245) that are bringing a new understanding of the relationships of upland erosion rates to the filling of ponds and lakes under varying conditions of different watersheds.

Thus conservationists are gaining a needed awareness of the erosion process in its entirety.

Cover: A farm pond on a day in June in the Broad River Soil Conservation District, Ga., is a place for family recreation.

Soil Conservation

Devoted to the wise use of land and water resources

JUNE 1966

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INCIDENTAL BENEFITS of farm ponds often outweigh the purposes for which they were originally built.

A survey of 200 pond owners in New York State showed that fishing, swimming, fire protection, and waterfowl production are leading uses, although livestock watering is a frequent initial reason for the construction.

This is not surprising, however, when one considers the diversified interests of the more than 15,364 landowners for whom the Soil Conservation Service has provided technical assistance for pond construction in New York since 1943.

Utility and recreation

The survey showed that the use of ponds varied by locality and occupation of the owner. In farming regions, ponds are built primarily for livestock water and irrigation; in other regions, recreation and the attraction of wildlife

A harvest of fringe benefits . . .

Popular Uses of Farm Ponds in New York

By Robert E. Myers

Wildlife Biologist, SCS, Syracuse, N.Y.

are the principal motives.

Statewide, of the seven most frequent uses made of these ponds, five are recreational. As reported in the survey, the ranking uses are: Fishing, 85 percent; swimming, 71; fire protection, 65; livestock watering, 50; ice skating, 49; picnicking, 40; and nature study, 32.

The fire protection value of a pond was rated high among farmers and summer residents in re-

mote areas where other water supplies were scarce. The survey showed that 4 percent of the ponds had actually been used in fighting fires, most of which were in farm homes and buildings.

A few unusual uses of ponds included the training of retrievers, "surfboarding," sailing, and baptisms.

The utility and recreation-wildlife values of a pond are increased when livestock are fenced out and watered at a tank below the pond. Only 23 percent of the owners allowed their cattle to drink directly from the pond.

Fish vs. waterfowl

The steeply sloping shoreline found in many ponds used for raising fish is not an asset for waterfowl production. This construction feature reduces the zone of emergent vegetation which provides food and cover for waterfowl. Nevertheless, most of the ponds do have some emergent vegetation.

Observations revealed that the majority of plant species found in the ponds were not highly valued waterfowl foods. The dominant plants were of the rush and sedge families. The latter, especially, rate only poor to fair as waterfowl food. Most of these plants did provide good escape cover.



A grassed beach area adjacent to a pond is one of the recreation centers in a 20-acre camping area on a farm near Newfield, N. Y.

Waterfowl food plants were found in all zones of the pond. In general, the submerged plants growing in the deeper water were the most valuable to waterfowl.

Many of the emergent plants were valuable muskrat foods.

Waterfowl nesting cover

The vegetation in the fields adjacent to most of the ponds contained suitable grasses and weeds more than 7 inches high that would provide waterfowl nesting sites. Intense grazing and crop rotations often change or destroy nesting cover. Nesting cover conditions were most stable around ponds located on idle land or in large fenced areas.

Not all types of habitat improvements benefit waterfowl. Extensive plantings of evergreens surrounding a pond seem to discourage ducks from nesting after the trees reach 4 feet in height.

Seasonal use by waterfowl

Reports from the pond owners showed that New York ponds are used extensively during the spring and fall by migrating waterfowl for resting and feeding.

Ducks used 75 percent of the ponds surveyed during the spring migration and 68 percent in the fall. This is higher than reported



Fishing, even in the dead of winter, is a favorite use of New York ponds.

for ponds in Ohio or Missouri.

Eighteen percent of the ponds were used by geese in the spring and 23 percent in the fall.

Geese seem to require no minimum size in the ponds they use. Several as small as 0.15 acre were utilized. The birds fed in nearby fields and returned to the ponds for water. A few ducks also frequented the small ponds, but larger

flocks were observed only on the bigger ponds.

The surveyed ponds produced an average of six ducklings per brood raised to fledgling age, compared to five per brood in New York marshes.

Newly constructed ponds require at least 3 years to establish enough plant growth to attract nesting ducks. The critical factor is not

Provision of livestock water was the initial purpose of constructing many farm ponds in New York. A convenient supply for fire-fighting, in case of need, is a secondary benefit.



cover but the food supply. Where broods of ducks had been produced, there was a greater variety of plants than in the average pond. During the summer months, 35 percent of the ponds were frequented by ducks and their young as they ranged out from their nesting ponds looking for additional food.

Many of the ponds that were appraised as having a good growth of food plants and suitable nesting cover were never used for nesting. Also, several of the brood ponds appeared to lack either good quality food or cover. This emphasizes the fact that it is practically impossible to predict whether or not a pond will be used by waterfowl.

Most of the broods were produced on ponds with a stable water level.

Wildlife benefits

Waterfowl are not the only types of wildlife benefiting from farm ponds. Several of the pond owners reported that a great variety of songbirds, swallows, and herons had been attracted by their ponds. They had observed such other kinds of wildlife as great blue heron, little blue heron, green heron, egret, gulls, deer, fox, raccoon, opossum, beaver, muskrat, and mink.

How does human activity associated with the recreational use of farm ponds affect waterfowl nesting? The survey indicated that mallards are one species that will nest near actively used farm ponds, even in the vicinity of buildings and roads, if suitable cover is available. Six percent of the broods produced on the surveyed ponds, most of which were used intensively for recreation, were raised within 100 yards of buildings and roads.

It is obvious that pond owners are harvesting a generous package of fringe benefits from their efforts—and so are many kinds of wildlife. ♦

Erosion-Sediment Studies

Indiana surveys link accumulations in reservoirs to soil loss rates on uplands

By Stanley H. Murdock

Geologist, SCS, Paoli, Ind.

SOME of Indiana's rolling cropland is losing more than 20 tons of soil an acre each year.

These excessive rates, mostly due to sheet erosion, are confirmed by recent reservoir sedimentation surveys by the Soil Conservation Service and other members of an interagency committee in Indiana.

Reservoirs, regardless of their intended use, trap most of the sediment originating from eroding areas upstream. Estimates of erosion rates, therefore, are essential to engineers to design structures with proper space for sediment storage.

The Soil Conservation Service in the early 1940's began sediment surveys on several Indiana reservoirs. The U. S. Army Corps of Engineers conducts continuing sediment studies on the reservoirs

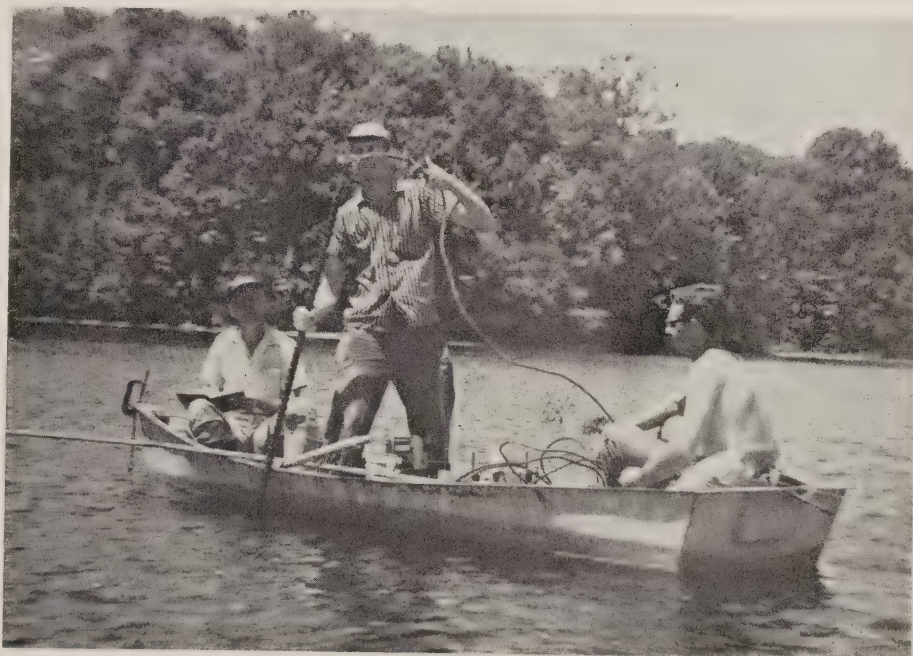
it operates. Suspended sediment load and water quality measurements are also being made on certain Indiana streams.

Design information

The information obtained from these studies has been useful in planning and designing water impoundments. Although the need for much more information has been recognized for some time, only in the past few years has coordinated action been taken to meet it.

In 1963 a statewide interagency committee came into being for the purpose of studying erosion and sedimentation. Besides the Soil Conservation Service, active participants are the Corps of Engineers, U. S. Geological Survey, Division of Water and Geological Survey of the Indiana Department of Nat-

A probe is used to determine depth of sediment deposits along a sampling line across a lake.





Active erosion, evident in many places on the uplands, is verified by measurements of sediment collected in reservoirs. One year after construction, an unprotected open ditch (l.) is sloughing and feeding sediment into the drainageway. A barren building site on the edge of a city (r.) also is a critical erosion area.

ural Resources, and Indiana State Board of Health.

The statewide committee meets every 2 or 3 years to assess progress and provide overall guidance. A subcommittee selects projects, assigns fieldwork responsibilities, holds semiannual meetings, and makes periodic progress reports to the cooperating agencies and organizations. The SCS representative is subcommittee chairman.

The original project plans anticipated comprehensive studies to include hydrology, geology, meteorology, and other related interests. The lack of funds, however, has limited current studies to erosion and sedimentation. Present plans call for a sedimentation survey of a different reservoir each year, including an inventory of the erosion characteristics of its drainage area.

Removal and deposition

Sediment surveys reveal the amount, nature, and distribution of sediment in reservoirs and their entrance channels. The findings are used to determine annual rates of sediment accumulation.

The upland erosion study determines annual rates of soil loss occurring in the reservoir's drainage area by use of soil loss equations to compute sheet erosion and other accepted Soil Conservation Service procedures to estimate the extent of other types of erosion. Computed quantities of upland erosion are adjusted and correlated with the sediment survey to provide a basis for estimating sediment storage requirements.

A sediment survey of a reservoir begins with the establishment of a system of ranges or sampling lines across the impoundment area. Depths of water and thickness of sediment are measured at intervals along each range.

For reservoirs where no previous surveys have been made, the measurements may be made by spudding or probing. The spud, a heavy iron instrument calibrated in tenths of a foot and attached to a marked rope, is dropped vertically from the boat so that it penetrates the sediment and into the original surface soil. It is then drawn to the surface, and the thickness of sediment is determined.

Where the top of the sediment and the original bottom surface are easily discernible, a probe or sounding pole made of steel, aluminum, or wood can be used from the boat to measure the thickness.

If a reservoir has been previously surveyed and the original ranges can be located, resurveys can be made by the use of sounding instruments, such as a fathometer. The U. S. Geological Survey, in cooperation with the Division of Water, Indiana Department of Natural Resources, arranges for and carries out the fathometer studies.

Taking another look

A boat carrying the equipment is moved at a constant speed along the range. Sonic impulses emitted by the fathometer are reflected from the sediment surface back to the instrument to indicate the depth of water along the range. The difference in water depths from one survey to the next indicates thickness of sediment that has accumulated during the period between the surveys.

Samples of the sediment are obtained for determining volume-weight relationships and other information for comparisons with the upland soils.

Results from the Indiana studies show that rates of sediment accumulation range from about 300 to 3,500 tons per square mile annually. The loss of reservoir storage capacity due to sediment accumulation ranges from less than one tenth of 1 percent to more than 1 percent annually. Although

the rate of sedimentation may not seem too serious in some instances, it should be remembered that the sediment accumulation in a reservoir represents an absolute minimum figure for the amount of erosion occurring in its drainage area.

The delivery ratio

Variables affecting both erosion and sedimentation must be studied. With other considerations being equal, a drainage area with the most cropland produces the most sediment.

In Indiana's climate, larger drainage areas deliver a smaller proportion of the total eroded material to their reservoirs than do smaller drainage areas. Similarly, a highly channelized drainage area delivers more of the eroded material to a specific measuring point on a stream than one with few drainageways.

The ratio of sediment yield at a specific downstream point to the gross, or total, erosion occurring in the drainage area is called the "delivery ratio." These concurrent studies of erosion in the watershed and the accumulation of sediment in the reservoir provide the information for determining the delivery ratio and for analyzing the factors that influence it. In view of the ever-increasing need for water for many purposes, erosion-sediment relationships take on great importance.

Of particular interest to the Soil Conservation Service is the effect of land treatment measures in reducing sediment. Although some information is available at research plots, larger watershed drainage area studies may be more realistic.

Agencies and organizations concerned with water resources in the State of Indiana agree that the maximum potential economical use of each impounding site should be utilized. The accuracy of sediment storage estimates is important in designing economical multipurpose dams. ♦

Game and Cattle Make a Paying Combination for Rancher

By Ray C. Borchard

Work Unit Conservationist, SCS, Grass Valley, Calif.

A GRADUATE forester with a yen for game management is demonstrating that game and livestock make a good combination for ranchers caught in the squeeze on the cattle industry.

Ray Conway of Grass Valley, Calif., is sole owner of North Star Pheasant Farm; part owner and manager of Quail Valley Enterprises' 1,250-acre ranch; and manager of another 2,000-acre ranch nearby which he leases. Conway's partners in the 1,250-acre ranch are Dr. Harry Stewart and Joel Bierwagen.

Quail Valley Enterprises has developed the Quail Valley Shooting Preserve on the ranch. It also has a trap and skeet shooting facility under franchise from a sporting arms manufacturer.

The combined ranching and hunting enterprise is operated under a farm conservation plan in cooperation with the Nevada County Soil Conservation District.

From chickens to pheasants

This multifaceted operation had its beginnings in 1942 when Conway acquired a chicken ranch. It wasn't long before Conway was beginning to raise pheasants also.

After World War II, the poultry market was no longer profitable and Conway switched to pheasants entirely. Now he raises 8,000 to 10,000 a year. These are sold to pheasant hunting outfits, including the Quail Valley Shooting Preserve.

Livestock goes with the pheasant enterprise. Cattle are used as a

Ray Conway and his dog make a team approach on one of the brush piles placed in fields for quail cover.



"tool" for keeping grass at a desirable level for game management by regulating the time and intensity of grazing.

On the 1,250-acre ranch, 300 acres is in irrigated pasture and 920 acres in dry pasture. The rest is in corrals and homestead. The farm also has three large ponds that help supply the sprinkler irrigation system. Numerous small stock ponds have been constructed in the dry pasture areas by the previous owner.

The 2,000 acres leased by Conway has been fitted into the hunting enterprises.

The skeet and trap range has six fields. Facilities include a novel clay target game, "Crazy Quail," which realistically duplicates many angles encountered in field shooting. It also includes a night-shooting setup, a modern clubhouse, and a large parking area.

The Soil Conservation Service provided engineering help in leveling the area for the skeet facility. This involved moving 7,000 yards of earth.

Trial plantings of reed canarygrass in wet areas and Perlagrass in other areas are being studied for potential wildlife usefulness. The canarygrass will break up larger areas by providing food and cover for pheasants. Perlagrass will provide food and cover for upland birds and deer.

Ponds used for irrigation are stocked with bass, bluegill, and channel catfish to give club members an opportunity to enjoy some fishing. California Department of Fish and Game has helped with this phase of the project.

The completed recreation and ranching enterprise was opened in August of 1965. Ten thousand clay birds were used on opening day and 9,000 the next day.

The hunting preserve offers pheasant, bobwhite quail, and chukar partridge shooting. In season, it has native California Valley quail, dove, bandtail pigeon, and deer.

Add these enticements to the beautiful rolling oak- and grass-covered hills, with conifer forests higher up, and you have something with strong appeal for outdoor-minded people. ♦

Recreation Area Pays Off for Colorado Rancher

(Picture on back page)

SOL TUTTLE of Gunnison, Colo., is finding that ranching and recreation do mix and provide a good living. His 10-acre campground and recreation area is turning out to be a profitable and enjoyable addition to his already established cattle ranch and trout farm operation.

"I decided to add the recreation enterprise," Mr. Tuttle said, "because it appeared that with completion of the Blue Mesa Reservoir, a modern campground facility near the reservoir and the city of Gunnison would provide a needed service to the public and add income to the overall ranch operation."

When Kampground of America representatives approached Mr. Tuttle early in 1965 about taking over one of their franchises in the area, he had a design of the campground developed.

In planning the recreation area he tried to use the natural features, including native cottonwood trees, to their best advantage.

A cooperator with the Gunnison Soil Conservation District, he contacted the local Soil Conservation Service office for technical assistance in the design and construction of a small lake to add water recreation and natural attractiveness.

The main building on the premises was completed in the spring, housing the office, a camp store, living space, and restrooms.

In early summer a road system was developed and water, electric service to each trailer space, picnic tables, and barbecue grills were installed. Another area was designed for tent camping.

The 1½-acre, 5-foot-deep lake was completed during the latter part of July. All of the excavated materials were used in the roadways and as base material for

Ray Conway, manager of the Quail Valley Shooting Preserve, and his setter, Blitz.



trailer spaces on both sides of the lake.

Waterbikes and canoes already are available, and plans call for addition of two small sail boats.

As an added attraction Mr. Tuttle has obtained approximately three-eighths of a mile on Gunnison River for trout fishing at no charge to guests. He also has a stocked lake open to guests and the public.

He said many people prefer to use his equipment and have a guaranteed catch from his ponds at 10 cents an inch than to buy a State license and fishing equipment, hoping to catch fish from nearby streams.

Reviewing the campground and recreation operation for the first summer, Mr. Tuttle noted that "many travelers selected their cross-country routes so they could stop at Kampground Organization of American established areas."

During the first 5 weeks of the operation he said he had an average of 20 units a night at his facility. He feels that with early local advertisement this year he will be able to increase this to 40 units, to provide him a fair return on the approximately \$30,000 invested in land and facilities.

Future plans call for 12 to 15 additional camp spaces with water, electricity, and sewage facilities for guests who want to stay for extended periods, or possibly all summer.

Tuttle's future plans also include a large boat for sightseeing and fishing on Blue Mesa Lake and development of permanent tent installations for those who wish to spend a night camping out.—EDWIN P. ENGLE, *Work Unit Conservationist, SCS, Gunnison, Colo.* ♦

Conifer Hedges

For coniferous hedges seedlings that have been transplanted once in the nursery are preferable, i.e., seedlings 3 to 4 years old from seed. ♦

SCD-Owned Land in Connecticut Town Is Conservation Showcase

By Albion L. Weeks

Work Unit Conservationist, SCS, Brooklyn, Conn.

THE WINDHAM Soil and Water Conservation District in northeast Connecticut is making good use of a 76-acre tract it owns and operates as a conservation showcase.

The land was given to the district when the county form of government was abolished in Connecticut in 1960. Prior to that time the district was concerned mainly with farmland.

The broadened program of the sixties produced the need to serve a variety of interests involving private and public lands.

With the donated land strategically adjoining the Agricultural Center Building in the town of Brooklyn the district supervisors got help from the Soil Conservation Service and prepared a com-

plete and coordinated conservation plan.

A small part of the acreage is in grass. The remainder is devoted to a variety of woodland, wildlife, and recreational land uses. Under this setup the district can show alternatives that can be used in a conservation program.

Conservation practices

Practically all the woodland conservation practices applicable in eastern Connecticut are on display—tree planting, underplanting, weeding, thinning, pruning. Wildlife measures include cutback and planted borders, woodland clearings, annual food plantings, and others.

An important feature is a system of connecting grass-legume strips 60 to 80 feet wide which traverse the area. This system serves a multitude of purposes—firebreaks and access roads, nature trails, wildlife habitat, hiking and bridle paths. A variety of grasses and legumes are growing in the strips, including clovers, vetches, birdsfoot trefoil, reed canarygrass, tall oatgrass, and orchardgrass.

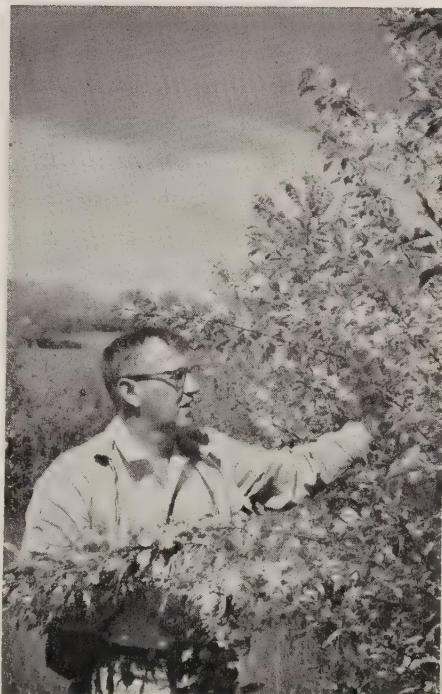
Where the woodlands meet the strips, wildlife borders are being developed by cutting or planting.

Fertilizing wildlife shrubs

Perhaps the most dramatic lesson is seen in the effects of fertilizing and mulching wildlife shrubs. Many landowners of the Northeast have been discouraged after a few years due to high mortality or puny growth in their wildlife plantings.

On the district's land, supervisors show fruiting plants 5 to 10 feet high grown from seedlings set

The author observes the good growth of a fertilized crabapple tree planted in 1961.





This 1-acre trout-stocked pond is on the 76-acre tract owned and operated by the Windham, Conn., Soil Conservation District.

out in the spring of 1961. Fertilizing and mulching have made the difference.

A wide cross section of Connecticut landowners have found the 76-acre tract a fertile source of ideas to be applied to their own land.

Private landowners, towns, and municipalities, fish and game clubs, and schools all find answers on the district tract to their conservation questions.

On one plot the Soil Conservation Service is testing new plants. The wide variety of plants and practices makes up a conservation arboretum. It is a place where people become familiar with the trees, shrubs, grasses, and legumes that are important for conservation purposes.

Town conservation commissions have become an important force in southern New England, and the commissions and the district have many aims in common.

Promotion of conservation on private land is a basic aim and the Windham Soil Conservation District is using its tract to point out many of the conservation opportunities that exist on private land and how to develop them. ♦

Gully Planting Shades Seedlings

PUTTING transplant beds of other evergreens between rows of pine trees is helping Hoskins Shadow and his son Don, nurserymen of Winchester, Tenn., to realize extra benefits from an 18-year-old pine plantation.

The Shadows acquired the pines several years ago when they bought additional land to enlarge their nursery, which is a cooperator with the Franklin County Soil Conservation District. The tract included 2 acres of loblolly pines set out by the former owners to halt erosion on severely gullied slopes. The trees had completely healed the gullies and laid down a thick mulch of needles.

As their nursery continued to expand, the Shadows needed more land to grow the popular broad-leaved evergreens. It occurred to them to put the transplant beds in the shade of the pines and they prepared the first ones in the spring of 1964.

The first row of pine trees was left standing. The second and third rows were removed and the

wood used for firewood. The area was smoothed with a bulldozer, covered with manure and peat moss, then thoroughly disked. Beds were edged with cross ties, and the holly and other evergreen plantings were put in.

The pines provide the partial shade needed by the seedlings. In addition, their falling needles make a thin mulch over the beds in winter.

Hoskins Shadow has been in the commercial nursery business for 25 years. In 1963, son Don finished a 4-year course in horticulture at the University of Tennessee and came into the family business. He and his father have developed a complete conservation plan for their nursery with the conservation district.

The plan includes a system of terraces on the slopes above the pine plantation to divert runoff water. The terraces empty into a sod waterway which runs into an irrigation pool used for the nursery.—C. M. HENNINGER, *Woodland Conservationist*, SCS, Nashville, Tenn. ♦

Hoskins Shadow and son Don look over plantings of evergreens placed between pine trees. Beds are located in space where alternate rows of pines had been removed.



Conservation Helps Bring Beauty to Kentucky County

By Luther C. Gabbard

Work Unit Conservationist, SCS, London, Ky.

CONSERVATION measures and cleanup campaigns are working together to bring new natural beauty to Laurel County, Ky.

The efforts and their results are receiving widespread attention. London, the county seat, twice has captured the Distinguished Achievement Award from the National Cleanest Town Contest.

Community improvement began with recognition by the London-Laurel County Development Association that plans for stepped-up tourism and recreation in the county could not be carried out in an ugly environment. Through an aggressive Beautification Committee, the Association initiated a "Cleanup, Fix-up" Campaign for London and Laurel County.

London lies at the crossroads of highways U.S. 25 and Kentucky 80. It is the focal trade center for southeastern Kentucky in the Appalachian region.

Land use problems

Steep hills, cliffs, and rough terrain cover much of the land in Laurel County. Practically all the land level enough for continuous row crops is located in small tracts along creeks and streams.

Most of the soils are of sandstone or acid shale origin with low fertility. With agriculture as the base of the county's economy, opportunity for economic betterment was low. Development of resources and facilities now are bringing a yearly gross income of nearly \$4 million into the county.

Much of the ugliness that has blighted the Laurel County land-

scape is the result of using soils for purposes to which they are poorly suited. The dumping of inadequately treated sewage, industrial wastes, and silt from eroding lands into waters of the county continues to impair the usefulness of these waters for industrial, domestic, and recreational use.

Other local problems include strip mining, which in many cases has caused soil erosion, stream pollution, accumulation of stagnant water, and seepage of contaminated water.

These problems have lowered the value of agricultural land and counteracted efforts to protect and improve soil, water, and related resources.

SCD work helps

A primary force in improving natural beauty has been the Laurel County Soil Conservation District,

assisted by the Soil Conservation Service. Since the district was organized in 1946, land owners and operators have been assisted in planning and installing more than 935 acres of grassed waterways, 835 farm ponds, 1½ million trees, and 59,879 acres of woodland improvement practices.

In addition, several thousands acres of hay and pasture land improvements have been applied. In the past 3 years, 3,877 acres of cropland has been converted to grassland.

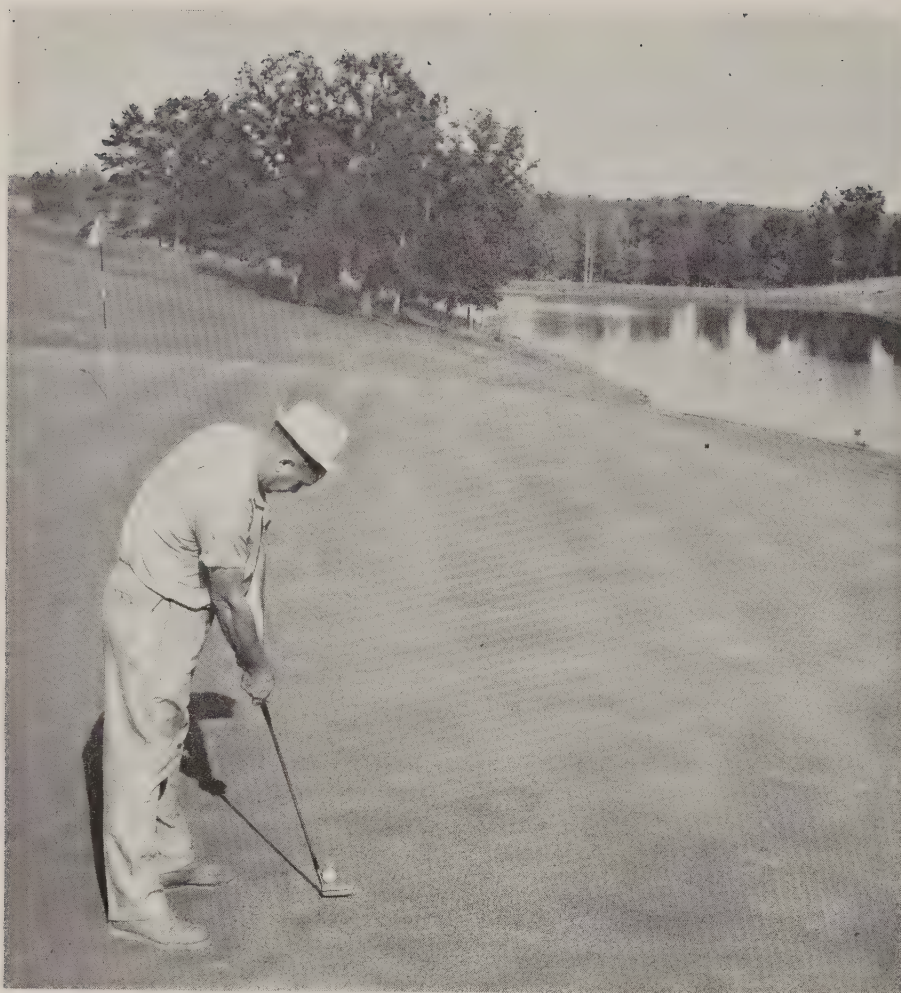
Land users cooperating

Some 800 land owners and operators are cooperating with the district in carrying out planned soil and water conservation work. These activities not only have added to the economy of the area, but also have improved the beauty and usefulness of resources.

SCS assistance in preserving and developing natural beauty has not been on farmland alone. The nonagricultural landowner likewise has been helped in stabilizing critical areas, making recreation and wildlife plantings, and in using soils information in planning for sewage disposal, parks and industrial sites, and other uses of land.

Plant Manager Gordon E. Largy (l.) discusses conservation plan for the textile firm in background with W. L. Browning, supervisor of the Laurel County District.





An SCS-designed pond and technical help in green and fairway management add to the beauty and usefulness of the London Country Club golf course.

and Ky-31 fescue. SCS technicians recommended the use of netting to help hold mulch in place to protect the areas until the plants were established.

Other consolidated schools with plans developed and carried out include Johnson and Keavy Elementary Schools, where the Soil Conservation Service assisted in planning, layout, and application of lawn and playground areas, grassed waterways, diversion channels, tile lines, and woodland conservation practices.

Other beautification projects include planting pine trees to screen junk yard areas around London, and planting autumn olive for wildlife food and cover around pond areas. Consultive assistance is annually provided to more than 100 nonagricultural landowners on various problems related to conservation and beautification.

In cooperation with the Kentucky Division of Fish and Wildlife, a conservation plan with emphasis on recreation and wildlife has been developed on the Laurel County Sportsmen Club near London. At the present time a conservation-recreation plan on a 75-

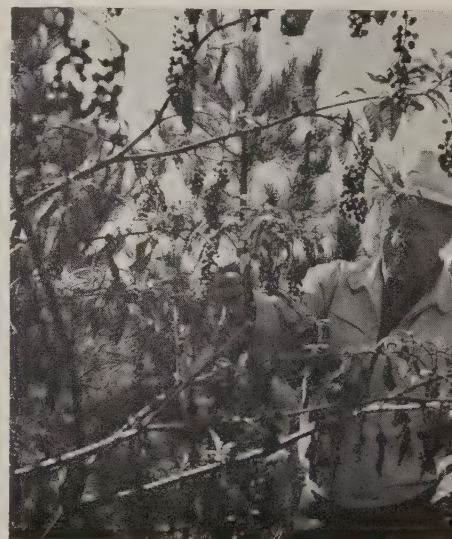
With SCS technical assistance, a recreation pond has been constructed, 5,000 feet of tile drains installed, and 2 acres of grassed waterways shaped and seeded at the London Country Club. Technical assistance has been provided in maintaining greens and 79 acres of fairway, in addition to planting 2 acres of trees and other beautification projects.

A conservation plan also was developed for the Caron Spinning Company plant site. The plan included stabilizing critical areas by planting shrubs and white pine trees around banks and adjacent to the highway, installing 2,050 feet of tile drainage and 3 acres of grassed waterways, plus land smoothing and other measures.

A conservation plan was developed last year by the London Independent School District. As a part of the plan, critical areas were stabilized with crownvetch



The author inspects pine (l.) and autumn olive (r.) planted on strip-mine spoil to improve the land and benefit wildlife.





Gordon Largy and the author discuss hemlock planting made to beautify textile plant site.

improvement have contributed much to the success of the cleanup drive. Johnson and Keavy Elementary Schools organized work corps and cleaned all the public dumping places in their communities. They also volunteered their help to people in the school district and canvassed all roads for the removal of junk cars.

The State Department of Highways donated the use of its trucks and crews for 6 days to pick up litter and refuse throughout the county.

London's new garbage truck, one of the most modern on the market, is now in operation, and a new street sweeper for the city of London has been purchased and placed in service.

Many stores and offices have planted flowers and shrubs in

boxes and cans.

A "service station of the week" is selected by a committee who visits the stations and scores them on appearance. Several service stations have set shrubbery, planted flower boxes, and are keeping the service areas and restrooms neat and attractive. Curbs, litter cans, and pavements are newly painted and washed clean.

"There is still litter to be picked up beside the roads in the county," said Mrs. Edith Feltner, chairwoman of the Beautification Committee. "The campaign will not be stopped until all the litter has been cleaned up along with all the junk cars in the county."

There is conservation work yet to be done, too; it is a continuing job. And as it spreads across the land, it too will bring new beauty to Laurel County. ♦

acre area bordering on Levi Jackson State Park is being developed for recreation.

School projects in community

Conservation plantings help stabilize a critical area in the Rolling Acres subdivision in Laurel County.



USDA Agencies Join in Solving Water Problem

ARAGING TORRENT in spring; a feeble trickle in midsummer.

That was the story of Shell Creek in Wyoming before watershed farmers got together with the Soil Conservation Service and other cooperating Department of Agriculture agencies to formulate a long range program to assure a dependable water supply.

For 60 years, maintenance of the McDonald Ditch-Shell Canal east of Greybull, Wyo., was a serious problem for 78 farmers dependent upon it for irrigation water and their livelihood on more than 4,000 fertile acres.

The problem was complicated because half of the irrigated land is at the head of the canal, separated from the other half by an arid area known as the badlands, through which the Shell Canal twists for 30 miles to deliver water to the lower farms.

About 1950 the landowners, through the Shell Valley Soil and Water Conservation District, asked for and got technical assistance from SCS, cost-sharing from the Agricultural Stabilization and Conservation Service, and financing from the Farmers Home Administration, to make improvements in the badlands section of the canal, as the first step in rehabilitating the system.

In 1957, the Shell Reservoir, a 2,000-acre-foot storage facility was constructed to supplement ancient Lake Adelaide, built in 1915. Big Horn County ASCS Committee shared in the project cost, and FHA financed the group's share.

With the late season water supply problem solved, the next phase was replacement of an inadequate diversion structure on Shell Creek and more upstream storage. A new SCS-designed structure that would withstand spring floods and provide dependable control was installed in 1964, protected by rock dikes and riprap, with



Shell Creek, en route to the Big Horn River, flows through some rough country marred by wind and water erosion.



A new structure on the McDonald Ditch-Shell Canal (c.) helps eliminate a bottleneck in the "badlands" near Greybull. The diversion structure (bottom) contains 158 cubic yards of concrete and 5 tons of reinforcing steel to withstand spring floods.



manually operated steel gates for flow control. ASCS again cost-shared.—DOMINIC FEELEY, Work

Unit Conservationist, and ROY BUCHMEIER, Soil Conservationist, SCS, Greybull, Wyo. ♦

Peace Found on Blayer's Blvd

"If you've ever lived in the city, then you know what we are after up here," remarked Al Blayer as we walked over his property.

Blayer explained that he wanted peace, quiet, and a chance to get back to nature.

A New York newspaper man, Blayer's not wealthy. He is simply a city man with a wife and two teenage boys who has learned to appreciate the everyday things of Vermont most of us take for granted.

Together he and I worked up a conservation plan for his 35 acres of Green Mountain foothills in Shaftsbury. He made the decisions as I pointed out the alternative uses he could safely make of the land.

Basically his property is old pastureland now grown up to larch, spruce, and hemlock trees with an occasional opening here and there. Much of the land is dry and rocky with the exception of a swamp about 2 acres in size.

Blayer's first question was: "What can I do with what I have to keep it wild and yet improve it?" Since he had no desire for crop or pastureland, the use dictated wildlife and woodland.

To wake up in the morning with fresh air in his lungs, birds singing, and a chance to see wild flowers, ferns, trees, and shrubs were other objectives. Toward this end Blayer applied conservation practices to provide water, cover, and food for wildlife and plants.

The swamp made a natural place to develop water. In line with long-range desires, he dug a pond deep enough for fish and large enough to attract birds and animals. It is now stocked with trout and attracts wood ducks.

Cover for birds and animals presented no real problem, for the

thick-growing spruce and other brush provided plenty. But, as time goes by and the trees grow larger, this will change. So, Blayer decided to maintain scattered open plots by cutting back the spruce in order to maintain a low brushy cover.

Blayer also considered food. The open plots would provide brushy growth for deer to browse and wild blackberries and raspberries for the grouse, song birds, and bears. In addition, we found a couple of old apple trees which, if pruned and released from competing vegetation, would provide food for birds, deer, bears, raccoons, and bees. Also present were some beech and wild cherry trees, and junberry, mountain-ash, and highbush cranberries that would produce food.

David Barton, Bennington County forester for the Vermont State Forest Service, showed Blayer how to thin the larch stand and make the release cuttings. He and his boys have made progress in carrying out the plans.

Thus, "Blayer's Blvd.," as his entrance is marked, provides conservation of peace, quiet, woodland, and wildlife for a family seeking refuge from city life.—**LAWRENCE H. PRATT, Work Unit Conservationist, SCS, Bennington, Vt.** ♦

Al Blayer's log cabin beside the wildlife pond he built on his country retreat.



District Gives Flagpole to USDA



Legionnaires taking part in the flag raising ceremony in Jennings, La., are Joseph L. McHugh (l.), J. W. "Bill" Watson, and C. E. Stackhouse.

THE GULF COAST Soil and Water Conservation District bought the flagpole for the new building for USDA agencies in Jennings, La., and USDA employees installed it.

Claude E. Stackhouse, retired businessman and Legionnaire for 46 years, led a group of American Legion notables in conducting the flag-raising ceremony. He was one of the original organizers of the Louisiana Wild Life and Fisheries Commission and recipient of the Woodmen of the World Conservation Award.

Also participating were Joseph L. McHugh, another 46-year Legionnaire and former State conservation commissioner, and J. W. "Bill" Watson, former parish police juryman and active supporter of the conservation movement.—**J. P. MAXWELL, Work Unit Conservationist, SCS, Jennings, La.** ♦

Daily Water Use

The average family of five in 1962 used 275 gallons of water a day in the home equipped with modern facilities. When that same family camped without modern facilities, it used 10 gallons a day. ♦

Transforming 80-Acre Farm in Mississippi

A Negro farmer-cooperator with the DeSoto County Soil Conservation District, Miss., James Hill, says he "tried conservation a sample at a time and was satisfied with the results."

H. I. Weeks, SCS work unit conservationist, and C. D. Potter, soil conservationist, Hernando, agree with Hill that there has been an "amazing change" in this 80-acre farm since 1954, when the first conservation practices were applied.

This native-born DeSoto-countian had farmed all his life, bought his own place in the fall of 1948. He had divided it in half—crops on one side, pastures on the other—without thinking about the capability of the land. He had a few lean cows that weren't doing as well as he had hoped, and some scrub hogs. The ditches were breast high in front of his house. A good part of the farm was severely gullied. The pond was inadequate and filled with muddy water.

But James Hill and his wife Johnanna had one tremendous asset. Both were hard and steady workers, willing to make a plan and to follow it year after year.

The first thing the Hills did, soon after they worked out a conservation plan with SCS assistance, was to take the steep land out of crops. They laid out a contoured field of cotton right beside the house on some of the better land. The contoured rows kept the soil from washing away. Fertilizer improved the yield.

In 1955 he took advantage of Federal assistance offered through the flood prevention program to improve pastures and plant trees on critical areas. He sowed sericia lespedeza on the steeper hills, established a program of rotated grazing which would permit him to carry more cows on his pastures. After a few years he acquired a registered Hereford bull to upgrade the herd.



James Hill (c.) discusses his farm plan with Work Unit Conservationist H. I. Weeks (l.) and Soil Conservationist C. D. Potter.

Pine trees and lovegrass were planted on 4 acres of severely gullied land. Through the years they have completely stopped erosion. Thirty feet tall now, straight and silken-neededled in the sun, the trees make a fine winter shelter for the cattle and will furnish a good pulpwood cutting in a few years.

At the end of 5 years James Hill bought a pickup truck. His wife began to perk up too. She was proud of the big new deep-freezer that enabled her to preserve good things from the garden.

They improved the house, built a good barn with a hayloft, and graveled the old rutty drive. The ditches in front of the house were filled up and growing grass. The fences were curved to the land's capability.

Better-blooded Duroc hogs replaced the lanky scrubs. "They pay better," says Hill. "They can turn food into meat better than scrubs."

Although Cooperator Hill has always been successful with growing corn, he now finds that 3 acres, planted on the contour on good land and well-fertilized, produces

more than enough feed for his hogs and mules.

"I used to plant lots more, but didn't make as much," he reports.

Watermelons he raised and sold gained a local reputation.

Last year, with ACP assistance, he built a new farm pond, and stocked it with bream, bass, and channel cat.

On nice days Hill can take off with his beagle hounds and go hunting for rabbits, secure in the knowledge that farmwork is well organized.

"Conservation has made my life easier. I don't have to cover as much territory," he says. "I can give what I do more time, and I make more with less work."—W. L. HEARD, *State Conservationist, SCS, Jackson, Miss.* ♦

Vegetation Management

Use and proper management of vegetation are basic to sustained profitable use of the 448 million acres of rotation crops, pastures, orchards, and vineyards and the 485 million acres in permanent pasture and range. ♦

Farm Recreation Center Attracts Many Visitors

“OLD TIZZY enjoys her pasture and leisure time since I changed my farm to an outdoor public recreation area,” Roy Masterson says. Masterson is the owner of Royma Acres, a 700-acre farm in southeastern Perry County, Ohio.

Tizzy is Masterson's 22-year old mule which shares the farm with 20 ponies and riding horses.

Masterson changed his farm into an outdoor recreation area in 1963. It is easily accessible from State Route 37, located 9 miles east of New Lexington. More than 4,000 people used the area last year. Masterson is hopeful that attendance will double, or triple, in the next 3 to 5 years.

Satisfied customers

Providing camping sites, sanitary facilities, and water for drinking, fishing, and swimming was a big task. Labor and material costs mounted. Sometimes it seemed discouraging. As camping areas developed, the people started inquiring, and almost before Masterson knew it, he was in the recreation business.

“A little money from recreation comes in handy, and satisfied customers spread the word,” Masterson said.

“I have received much help from the Soil Conservation Service and Agricultural Stabilization Conservation Service. The building of ponds, pine plantings, and many other conservation practices were advised and encouraged by these agencies. The farm foresters of the Ohio State Department of Natural Resources and the Cooperative Extension Service of Perry County have given much help too.”

Masterson has been a cooperator with the Perry Soil and Water Conservation District since 1946.



Tizzy gets a choice morsel from a college co-ed camper.

He served one term as district supervisor. In 1957 he received a tree farm award from the Ohio Division of Forestry.

Campfire sites, boating, swimming, and fishing, plus scenic drives through the area, attract many guests. Picnic areas, several large ponds, and pine plantations grace the hillsides. Full-time attendants serve as guides. A trading post is popular. Masterson started with two employees and now has seven full-time workers.

Boy Scouts from neighboring areas and as far away as Columbus, Ohio, come to Royma Acres for camporees.

More than 21½ miles of access roads serve the recreational areas. Trails and walkways lure many visitors. Pow Wow Hill, one of the highest points in the area, furnishes a good view of the thousands of acres of scenic vacationland.

Masterson has set aside 50 acres as a woodland sanctuary with a nature trail winding through it. Many guests use the ball fields, golf driving range, shuffleboard courts, and archery range daily. Square dancing, hayrides, and chapel services are held periodically.—LEO A. CLARK, *Soil Conservation Technician, SCS, Somerset, Ohio.* ♦

Water Control Rescues Orchard From Drowning

TEN YEARS of patient soil and water conservation effort have paid off handsomely in a small, 7-acre apple orchard near Yakima, Wash.

The orchard, in Hi-Land Soil and Water Conservation District, is owned and operated by C. M. Holtzinger Fruit Company, now headed by Charles Holtzinger, son of the man who launched the conservation effort with help of his conservation district and the Soil Conservation Service.

More than a decade ago, the orchard, set in a small beautiful valley 10 miles west of Yakima, had turned into a wet mass of willows, tules, and weeds.

The small stream through the area, fed by springs and irrigation tailwater, ran uncontrolled over the flat area. Overirrigated hillsides added excess water from springs and wet spots that appeared as much as 20 feet above the stream level.

By 1955 the owner had lost 10

acres of apple and pear orchard, and more trees were dying on the hillsides. Something had to be done.

Swamp in the sagebrush

This swampy state was quite a contrast, just as the healthy orchard had been earlier, to the surrounding sagebrush country. It was between 1915 and 1920 that sagebrush began giving way to irrigated orchards. By 1930 the expanded use of irrigation promised an even brighter future.

But there is such a thing as too much water—when used with too little knowledge of what unmanaged water can do on poorly understood soils.

Holtzinger signed an agreement with the conservation district. The SCS assisted in making surveys, including topographic and soil studies on the fields and analysis of the irrigation system and the water management practices.

Soil characteristics turned out to be the heart of the problem. The valley floor had about 5 feet of loamy soil over consolidated gravels and a hardpan. Expanding wet spots on the slope were coming from pressurized aquifers about 12 feet deep. To relieve

this pressure would require a deep drintile among the producing apple trees.

The plan was worked out and Holtzinger set to work. By 1959 he had constructed an open drain, approximately 1,000 feet long and 5 feet deep, through the valley floor. He installed in three segments 1,600 feet of drintile, with coarse sand and gravel filter material. A portion of the line was through a wet area that required extra gravel to stabilize the base.

From tules to trees

With the excess water removed, he cleaned out the willows and tules, releveled the area, and replanted to fruit trees.

By 1965 a healthy young orchard was growing in the valley again. Young trees have replaced older ones that finally had to be removed.

The elder Holtzinger who started the conservation and management project is now deceased. But his son, Charles, is pleased with the transformation from tules to trees. —CARL W. WALKER AND DON GLADSON, *Civil Engineer and Work Unit Conservationist, SCS, Yakima, Wash.* ♦

With a remodeled irrigation and drainage system, a new orchard rises where tules covered a swampy valley in the sagebrush.



Wind Damage Less in Great Plains

The Great Plains during the past winter suffered the lowest acreage damaged by wind in 12 years, reports from SCS field offices showed.

The 185 counties in the 10 States where wind erosion normally is a problem reported less than 350,000 acres damaged in the current season compared to 3,142,600 acres damaged in 202 reporting counties last year.

The damaged lands this time include 309,095 acres of cropland, 22,000 acres of rangeland, and the rest in other uses.

Three States in the Plains—Nebraska, Colorado, and Kansas—reported no land damaged thus far.

More soil moisture than usual, snow cover on wide areas of the Northern Plains, and effective soil and water conservation on some past problem areas are the reasons for this decline. ♦

Camping, Recreation Workshop Scheduled

The fifth Family Camping and Outdoor Recreation Workshop will be held July 10-16 and July 24-30 on the Flathead Indian Reservation near Missoula, Mont.

Sponsored by the University of Montana and the Confederated Salish and Kootenae Indian Tribes, this workshop provides instruction and experience in camping and outdoor recreation. College credit can be earned for the course.

On the schedule is a tour of the National Bison Range and quaint St. Ignatius with its original Indian Mission. ♦

Land Use Changes

The United States is experiencing the greatest period of land use adjustment since the completion of land settlement. Advancing agricultural technology and widespread urbanization combine to change the rural landscape with ever-increasing speed. ♦

Number of Farms Down More than Acreage

The number of farms continues to decrease each year more than the land in farms, according to the Statistical Reporting Service, USDA.

Discontinuance of small farming enterprises and merging of larger units with existing farms count for most of this decrease, rather than the encroachment of

urban and suburban extensions, widening highways, and other non-farm uses.

Farm numbers from 1959-66 declined 20 percent while land in farms decreased only 3 percent. The "average farm operator" in 1966 manages a unit of 350 acres—a fifth larger than 7 years earlier.

The number of farms in operation in 1965 was 3,380,000; total land in farms about 1,155 million acres. ♦

Conservation Cartoons on Display

CONSERVATION cartoons by Felix Summers, SCS technical illustrator, recently were on display in what was probably the first one-man show by an employee of the Department of Agriculture in the patio of the USDA Administration Building in Washington.

Summers is on the staff of the Regional Technical Service Center at Lincoln, Nebr. He has been employed by the Soil Conservation

Service since 1944. In addition to his technical drawings of engineering structures and other subjects, he has produced hundreds of cartoons that have been used widely by newspapers and magazines throughout the country to tell the conservation story.

The Secretary of Agriculture and other conservation leaders congratulated Summers at a review of the exhibit. ♦

Secretary of Agriculture Orville L. Freeman (foreground) and SCS Administrator D. A. Williams (l.) review the cartoon exhibit with the artist (c.) and the president and secretary-treasurer (l. to r.) of the National Association of Soil and Water Conservation Districts, Sam Studebaker, Tipp City, Ohio, and John Wilder of Somerville, Tenn.





CONSERVATION PROFILE

DeVon Jensen

Idaho

Lost River watermaster is a conservation leader

MENTION "WATER" in Idaho's Big Lost River Valley and folks right away think of DeVon Jensen.

Jensen, watermaster of Idaho Water District No. 27 and member of the State Reclamation Association for 7 years, has been striving since 1936 to improve conservation of the soil, water, and human resources of Big Lost River Valley.

DeVon Jensen was born in southern Utah. When he was 14 years old, his family moved to Salt Lake Valley, then in 1934 to the Lost River Area. There was severe drought that first summer and DeVon stacked hay for money to help the family through a difficult time.

When the Lost River Electric Co-op was formed in 1938 under the Rural Electrification Administration, Jensen was its first secretary-treasurer. He held that position 3 years, then was president of the REA board for 8 years. The co-op started with 180 members; it now has nearly 400 members and more than 300 miles of line.

He served on the board of directors of the Moore Canal Company and was its manager for 3 years.

District supervisor

In 1955, the Governor of Idaho appointed Jensen to the board of supervisors of the Butte Soil and Water Conservation District. He has served as a supervisor since,

including 4 years as chairman. He is now secretary of the board and equipment supervisor.

Jensen has been chairman of the watershed committee of the Idaho Association of Soil and Water Conservation Districts for 4 years. He is active in legislative work and played a major role in getting the Idaho Legislature to provide \$75,000 for accelerated watershed planning.

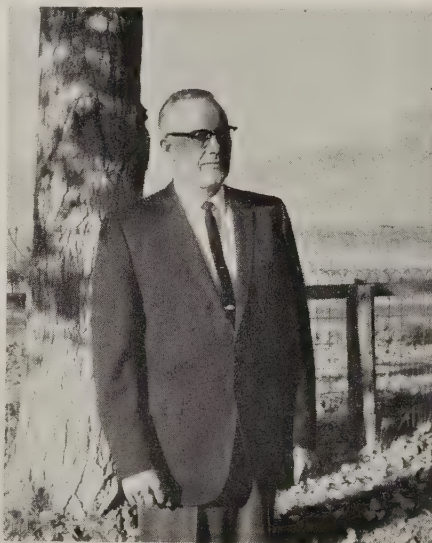
Jensen is also director and treasurer of the Idaho association. In 1963, he represented the Governor of Idaho at the National Watershed Congress in Philadelphia.

A conservation irrigator

Jensen owns and operates a 240-acre diversified farm. He has 100 acres under irrigation and raises hay, grain, and potatoes, and maintains a farm flock of sheep. He also has more than 140 acres of irrigated and dryland pastures.

He has nearly completed application of his farm conservation plan. He has leveled and rearranged his irrigation system with the result that seasonal water use was reduced from 6.5 to 3.5 acre-feet.

He is participating, through the district, with the SCS plant materials center in Aberdeen, Idaho, in a trial planting comparing bluebunch wheatgrass with Whitmar wheatgrass.



Jensen helps inform the public about conservation by speaking to many audiences on the principles, purpose, and practicality of basic conservation planning.

DeVon Jensen and his wife, Ruth, have raised a family of three girls and a boy, all away from home now. Mrs. Jensen is treasurer of the Ladies Auxiliary of the Idaho Association of Soil and Water Conservation Districts.

Jensen's recreational interests naturally turn to water. He enjoys fishing in the Big Lost River and its tributaries, high in central Idaho's rugged mountains.

From 1957 to 1961, he was Boy Scout troop committeeman and in 1962 and 1963 district vice chairman for the Boy Scouts. His son, Alan, is an Eagle Scout.

Jensen has also been active in school and church affairs. He served as a director of the Lost River school district 6 years. He was a bishop of the Latter-Day Saints Church for 7 years. ♦

Conservation Methods Save Irrigation Water

Farmers cooperating in soil conservation district and ACP programs in California are making great advances in irrigation water management through the use of proper facilities and methods.

In the seven counties of upper San Joaquin Valley with its approximately 3 million acres of irrigated land, Service personnel worked with the district cooperators on 61,000 acres.

Case studies show savings of 20 to 60 percent in water used per farm. Savings of \$5 to \$25 in cost per acre and from 3 to 12 hours per day in time of irrigation resulted from irrigation water management.

Southern California farmers made savings of 20 to 80 percent in water by using conservation irrigation techniques. Average use per acre of orchard irrigated with sprinklers is now 3.5 acre-feet, compared to 5 acre-feet formerly used. ♦



Governing Soil Conservation: Thirty Years of the New Decentralization. BY ROBERT J. MORGAN. (1966). *Johns Hopkins Press, Baltimore (for Resources for the Future, Washington, D. C.)* 399 pp., maps and charts. \$8.

This book is one of Resources for the Future's studies in land use and management. The author, professor of government and foreign affairs at the University of Virginia, was on leave from 1960 to 1962 as research associate with RFF to make the study.

Governing Soil Conservation does not assess or evaluate physical accomplishments on the land. That was the primary emphasis of a companion book, *Soil Conservation in Perspective* by R. Bunnell Held and Marion Clawson (reviewed in *Soil Conservation*, January 1966).

This well-written book is, rather, an appraisal of some of the political, economic, and administrative problems that will probably face the soil conservation program in the future. Not since 1952 when W. Robert Parks, now president of Iowa State University, wrote *Soil Conservation Districts in Action*, has this issue been so broadly analyzed by an academician. Morgan at one point admits that man's motives are normally both hidden and complex. But the book is a record of man's action in the field of soil conservation over three decades, regardless of motives hidden or exposed.

Professor Morgan's book confirms what many have long felt—that Abe Lincoln's century-old "people's department" is an exciting and challenging home for a career of public service. Old timers will read the book with nostalgia, seeking their names or those of close associates in the inti-

macy of long-forgotten memorandums or recorded discussions. Newcomers to this arena of public life will find the book a worthwhile reference.

The author has been consciously selective in stressing and analyzing the political processes through which soil conservation policy has been made and executed. He has purposely ventured beyond a conventional analysis of structure and function to focus on the interactions between governmental administration (structure, missions, specialization of skills, procedures, etc.) and political power.

Morgan reminds us that political ecology is as important to the life of a unit of government as physical ecology is to a living organism. It takes more than technical and administrative skills to achieve the purposes of government.

Consequently, the author offers both an analysis and a thesis in the final chapter by which he justifies the subtitle: "Thirty Years of the New Decentralization." This rationale should intrigue, at least, the present-day practitioners of the new "Creative Federalism."

The first seven chapters trace the origins and evolution of several complex issues reflected in the efforts of successive Secretaries of Agriculture to organize conservation administration in accord with the Department's objectives.

In the remaining chapters, he examines Federal-State-district relations; how district governing boards are selected and how they administer district operations; the type and extent of State and local financial and other help to districts; and the functions of district boards as policy-making agencies.

There is truth in Morgan's contention that the story he tells is, in part, a story of bureaucratic struggle for survival and success. I would add that the Soil Conservation Service is entitled to take pride in that struggle, for it is in the Nation's interest.

Professor Morgan states that his

book reflects his opinions and not others. I join in his hope that they will generate reflection, even where they invite dissent.

Surely, his predictions for the future are timely. Some years from now it will be interesting to match future facts against present projections. I am confident that Professor Morgan's book will make an important contribution to the future growth of conservation districts.—NORMAN A. BERG, *Deputy Administrator, SCS*.

The College of Agriculture: Science in the Public Service.

BY CHARLES E. KELLOGG AND DAVID C. KNAPP. 1966. *McGraw-Hill Book Company, New York*. 237 pp. \$6.95.

In 1962, the centennial year for the land-grant colleges as well as the Department of Agriculture, the Carnegie Corporation of New York commissioned Charles E. Kellogg, Deputy Administrator for Soil Survey, SCS, to study "the American colleges of agriculture," and the Administrator, authorized part-time leave without pay for Dr. Kellogg to carry on the study. As his associate, Dr. Kellogg chose David C. Knapp, a political scientist who is now Director of the Institute for College and University Administrators.

This book is the published product of the study. It is based on the accumulated knowledge of Dr. Kellogg backed up by in-depth interviews in more than half the colleges.

Dr. Knapp did most, but not all, of the interviewing. He talked to receivers of the information and services of the colleges as well as to administrators, faculty members, and students. Dr. Kellogg has been accumulating knowledge of agricultural colleges all his adult life—as a student in Michigan, a faculty member in North Dakota, and as a leader of the national cooperative soil survey since 1935.

The authors see *agriculture* as

far bigger than *farming*—as including not only production on farms but also processing and marketing the products, manufacturing the machinery and chemicals needed on farms, and planning for better use of all potential products of farms.

They begin the book with a statement of the challenges and missions of the present colleges of agriculture as they see them. Then follow chapters on their conclusions as to how the colleges can meet the challenges and serve their missions in three major areas—higher education, the quest for new truth, and extending knowledge to the public.

The book not only challenges the colleges to change and to seek excellence; it exudes an optimism that they can bring about the needed changes themselves. It leaves the reader with the feeling that the quest for progress in agricultural technology is in good hands. It should give each member of a college of agriculture a sense of satisfaction with his opportunity for public service.—RUTH NORDIN, *Information Division, SCS*. ♦

Imperatives in Education. BY AASA COMMISSION ON IMPERATIVES IN EDUCATION. 1966. *American Association of School Administrators, Washington, D. C.* 180 pp. \$6 (discount on quantities).

After 2 years of study, a special commission of the American Association of School Administrators has identified nine “imperatives in education.” These are explained, and reasons for their selection are given in separate chapters of this book.

Clearly and concisely stated, the imperatives are designated as “points at which the educational program must be revised and reshaped to meet the needs of the times.” They are:

To make urban life rewarding and satisfying.

To prepare people for the world

of work.

To discover and nurture creative talent.

To strengthen the moral fabric of society.

To deal constructively with psychological tensions.

To keep democracy working.

To make intelligent use of natural resources.

To make the best use of leisure time.

To work with other peoples of the world for human betterment.

It is especially significant that one of the imperatives selected by AASA is “To make intelligent use of natural resources.” For far too long education about natural resources, and particularly education concerning their use and conservation, has been regarded as an appendage to or something apart from the regular school curriculum. Here is solid evidence that school administrators are coming to consider imparting knowledge essential to the wise use of natural resources on a par with the traditional facets of the school curriculum.

Though prepared specifically for school administrators and educational leaders and already placed in the hands of more than 18,000 such people, this work should be of great interest to and can be read with profit by anyone seriously concerned with education of youth.—WALTER E. JESKE, *Information Division, SCS*.

New Publications

Natural Resources of California. PREPARED BY THE U. S. DEPARTMENT OF THE INTERIOR. 1965. *With contributions from the Forest Service, Soil Conservation Service, and Army Corps of Engineers.* 84 pp., illus. \$0.60. The 14th in the Department of the Interior's series of booklets on the natural resources of the States matches the previous issues (see *Soil Conservation* for April) in its description of the physical characteristics of its subject and in detailing its wealth of water and power, mineral resources, land and forests, and fish and wildlife.

An especially strong section on recreational resources includes a map and a 9-page tabulation of outdoor recreation areas.

Treatment of the work of the several Federal conservation agencies is brief and factual and gives more balanced attention than earlier booklets to organizations outside the Department of the Interior.

Education—Key to Conservation. BY CONSERVATION EDUCATION ASSOCIATION. *Interstate Printers and Publishers, Inc., Danville, Ill.* A series of booklets prepared primarily as helps for school teachers includes the following titles published to date:

(1) **Conservation Characteristics of a Good Local Program of Conservation Education.** 1965. 8 pp.

(2) **Planning a State Program.** 1965. 13 pp.

(3) **Twenty-five Key Guides for Preparing Conservation-Education Publications and Visual Aids.** 1965. 13 pp.

Range Plant Handbook. BY U. S. FOREST SERVICE. 1937, reprinted 1965. *Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Springfield, Va.* Unpagged (more than 800 pp.), illus. \$10.95. This widely known out-of-print handbook of western range plants is available again in a paperback reprint.

Indians of Oklahoma. BY BUREAU OF INDIAN AFFAIRS. 1965. *U. S. Dept. of Int.* 14 pp., illus. \$0.15. “As an Indian melting pot Oklahoma is unequaled,” says the introduction to this brief history of Indians in Oklahoma and description of the status of their lands and today's Federal programs for their welfare. A map shows the movement of some 50 tribes from other parts of the United States to Oklahoma.

Skiing. BY U. S. FOREST SERVICE. Revised 1966. *USDA PA-525.* 16 pp., illus. 20¢. Includes directory of ski areas on National forests.

Salt Tolerance of Fruit Crops. BY LEON BERNSTEIN. 1965. *USDA Agri. Inf. Bul.* 292. 8 pp., illus.

Soil Surveys

Clarke County, Mississippi. BY H. L. NEAL, B. G. MOSS, C. H. WHITTINGTON, J. W. KEYES, W. W. NYE, AND C. H. FREEMAN. 1965. 116 pp., illus.; maps 4 inches to the mile (1:15,840).

Bamberg County, South Carolina. BY ERON E. CROW, E. C. MOORE, AND O. L. DODD. 1966. 106 pp., illus.; maps 3.17 inches to the mile (1:20,000).

From the Administrator:

Conservation and Community Development



FROM the beginning of the work of the Soil Conservation Service emphasis has been placed on helping people help themselves.

The decisions that individual land owners and operators make about conservation and the measures they carry out have a great influence on community development. It is safe to say that a community cannot prosper unless it has a land base adequately protected and improved with a sound soil and water conservation program.

While the individual unit has had major attention in the past, it takes community action to accomplish conservation and economic development.

Involvement of more than farm people is necessary in order to conserve, develop, and improve our land resources. It takes community action—people working together under local leadership with technical and program guidance.

Soil and water conservation districts came about as a result of this need for involvement of a broader base of citizenship. The 3,000 conservation districts, under such leadership and administration, are proving their effectiveness in making conservation on the land a reality. Their programs are geared to action based on local needs and opportunities.

The Soil Conservation Service is now entering into an even larger role in community development. The expansion of nonfarm uses of land creates a wider demand for the specialized technical knowledge that the Service has developed in a quarter century of firsthand experience with soil and water man-

agement.

Soil surveys, initially made primarily to give farmers information that would aid them in producing crops, now have become the basis for planning the whole spectrum of land uses—from natural landscape for recreation to the most intensive kinds of industrial development. SCS conservation technology has expanded to match the broader applications of basic soils information.

Soil and water conservation districts, too, are recognizing the need to expand their programs to embrace new phases of conservation and resource development. The report of the Special Committee on District Outlook of the National Association of Soil and Water Conservation Districts, adopted at the organization's recent annual meeting, explores this broadened concept.

The report emphasizes the need for local legal bodies to: (1) Represent all of the community interests in ascertaining conservation needs and responding to their desires; (2) develop conservation and resources development programs for all the people; (3) involve all the people through appropriate representation in the decision-making process relating to national resource conservation and development; and (4) accept and carry out responsibilities, including the expenditures and financial allocations on behalf of all the people, in connection with resource programs and projects.

The committee believes that soil and water conservation districts can be the directing and coordinating bodies to perform these

functions at the local level. It correctly points out that districts today represent a going organization of strength and vitality; that they have amassed a body of knowledge and experience of great value in resource management; and that they have constructed a network of cooperative relationships with agencies and organizations of all levels. It would obviously be wiser, more efficient, and less costly to strengthen districts to serve the full range of resource needs than to begin anew to build an entirely new structure.

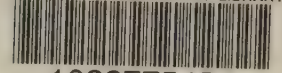
Such an evolution would add to the present soil and water conservation responsibilities of districts. It could, in many cases, lead to the emergence of broader focused conservation districts, as has already occurred in the State of Massachusetts.

In Massachusetts, under a new districts law enacted a few years ago, the conservation districts now provide assistance to serve all the people's needs—farm, rural non-farm and urban—on interrelated phases of resource conservation and development. While some of the resource problems, the governmental organization, and population pressures in that State are different from what they are in many others, a forward step has been taken.

The long experience of SCS in working with local people to accomplish soil and water conservation—the heart of community development—can contribute valuable insights into the complex problems of this effort at every field location.

It is the responsibility of every employee to exert his influence to help achieve the needed understandings and relationships for success—the understandings that will permit local leadership, with appropriate program assistance, to fashion realistic activities geared to local needs and opportunities.

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Income Recreation on a Ranch

Story on page 248.



Water, woodland, and natural beauty are the resources a Colorado rancher developed to establish this recreation area as an income-producing enterprise.

The 11½-acre lake was designed

and constructed with technical assistance from the Gunnison Soil Conservation District. Trailer and tent campsites with water, sewage disposal, electricity, and barbecue grills are spaced around the lake

with access to office and store.

This recreation enterprise is near Blue Mesa Reservoir and the city of Gunnison. Added attractions are trout fishing in nearby river and a stocked lake.

SOIL Conservation

DEVOTED TO THE WISE USE OF
LAND AND WATER RESOURCES



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RC&D Payoff . . .

The 10 original RC&D projects now have a couple of years of experience behind them.

What do they have to show for their efforts?

We asked our Resource Development people to give our readers a report on *what has been accomplished*—not what was planned—in some of them.

It was natural to turn first to the West Central Minnesota Project, launched in 1964 with such favorable attention to the Crow Wing Canoe Trail (described in *Soil Conservation*, January 1965).

RD fieldman "Lennie" Losh tells (p. 267) how the canoe trail idea has been enlarged to include land activities and, with a cluster of other project measures, boosted local income by \$136,000 in 1965.

We will have progress reports from other projects in the months ahead.

Wagons Ho: A similar idea, but developed by individual initiative, is the Wagons Ho recreation enterprise operated by a Kansas rancher.

SCS State Biologist Jack Walstrom and WUC Howard Cheney responded (p. 275) to our query about how an enterprising conservation district cooperator has turned local historical and natural resources to profit.

Pan American Congress: Delegates returning from the First Pan American Soil Conservation Congress bring encouraging word (p. 283) that provisions are made, through a permanent commission, to continue an activity so well begun.

COVER: Members of a saddle club come down to a landing where the Crow Wing Wilderness Saddle Trail joins its counterpart, the canoe trail, in the Wadena Soil Conservation District, Minn. It is part of the RC&D project described in our lead article.

Soil Conservation

Devoted to the wise use of land and water resources

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Crow Wing Revisited

Wilderness saddle trail brings influx of visitors and adds new jobs and dollars to Minnesota's growing RC&D project

By Linus B. Losh

Resource Development Specialist, SCS, Lincoln, Nebr.

CROW WING Canoe Trail started Minnesota's first resource conservation and development project with a splash 2 years ago.

The first of some 80 "project measures" planned to enliven the economy of a 5-county area, the vacation waterway played host to more than 2,000 canoeists in its first summer, bringing new business to outfitters, grocers, filling stations, and other businesses serving visitors.

How well has Crow Wing lived up to its early promise? What of the other measures so hopefully planned to bring new dollars into the area by developing its waters, woods, wildlife, and other resources?

More than 5,000 canoe enthusiasts explored the Crow Wing River in 1965, and the number is expected to increase again this year.

A new Crow Wing Wilderness Saddle Trail winds 30 miles along old logging roads through the pines, permitting riders to share some of the same campsites used by canoeists. Already, it vies with the canoe trail in popularity.

A way to do it

The original 80 project measures have now grown to 120—every one a dream that local people had nourished for years without an effective way to make it real. Now all are underway or being actively planned.

The measures already in operation provided about 40 man-years of employment and increased local income \$136,000 in 1965. It is estimated that by 1970 they will be adding 80 man-years of employment and nearly a million dollars of gross income annually. As additional project measures are

activated, new job opportunities and income to the area will be realized.

"Once the ball gets rolling, it keeps getting bigger and bigger," says John R. Rife, Wadena County conservationist and community leader in the West Central Minnesota RC&D Project.

The project area—Swift, Pope, Kandiyohi, Wadena, and Otter Tail counties—totals about 3.5 million acres, about 90 percent of it privately owned. It is 1 of 10 original pilot RC&D projects started in 1964.

Sponsors are the five soil and water conservation districts and the boards of commissioners of the five counties. Each district has its own committee which approves proposals and sets priorities before they are submitted to the project sponsors for action.

Establishment of the Crow Wing



Wilderness Saddle Trail, like its predecessor the canoe trail, illustrates how local people and government agencies work together to put natural resources and human talents to work.

Planning together

More than a year ago the Gateway Riders Saddle Club of Menahga and John Rife met and discussed the idea of a saddle trail to complement the canoe trail. They studied aerial photographs provided by the Soil Conservation Service.

State forestry officials and SCS Work Unit Conservationist Don Benrud provided technical help in planning and laying out the trail and corral locations. They considered carefully the erosion hazards, proximity to campsites, topography, types of vegetation, and needs for tree and brush removal. Selections were made with an eye to retaining the panoramic splendor and beauty of the rivers and forests.

Community leaders Frank Green, Menahga druggist who forsook the

Twin Cities for country living, and Hugo Pulju, local motel and restaurant owner, are two of the many who spearheaded local developments. The latter was instrumental in securing, at no cost, easements from all of the private landowners. The Minnesota Power and Light Company and the Northwest Paper Company cooperated in providing rights-of-way.

Easement forms and property owner maps were prepared by a Wadena attorney, free of charge.

Boy Scouts earned conservation merit badges by removing brush and doing general cleanup work on the trail and at camping sites.

The Minnesota Department of Conservation supervised 30 locally employed Neighborhood Youth Corps (NYC) boys in clearing the trail of brush, trimming trees, building corrals, and enlarging four of the camping areas used originally by canoeists.

The boys were paid almost \$13,000 in wages from funds obtained through the Economic Opportunity Act. The earnings provided pocket money, paid for

cars, and went into college savings. More important was the opportunity to learn to work, to enjoy outdoor activities, and to be of service to the community.

At the same time an estimated \$3,000 was spent in the area for supervision, transportation, working tools, chemicals, and other supplies. The developed trail is now valued at \$60,000.

One of the first groups to utilize the new facility was the 40-member New London, Minn., riding club, from 200 miles away. The North Central Saddle Club association held its annual ride on the new trail last September. More than 150 riders camped, stayed at nearby motels, and in other ways utilized products and services in the area for a weekend. This and similar groups have donated funds for upkeep to the local riding club.

How does this activity affect the well-being of Wadena County and nearby communities? Already facts and figures are coming to light.

Huntersville grocer Earl Anderson sold groceries and supplies to

Campfire activities were a part of the Crow Wing Wilderness Saddle Trail dedication. The action-packed weekend included a 2-day trail ride, overnight campout, and square dance.





Youngsters as well as adults share the excitement of activity about the headquarters corral of the saddle trail near the village of Huntersville.

the trail riders, including enough locally grown hay to bolster his income \$30 a day for the 3-day weekend.

One Menahga restaurant catered to the Saddle Club and netted \$344 in food sales. Total food purchased locally was about \$600.

Twenty of the riders rented horses from local and nearby riding stables at \$4.50 a day. Veteran canoe outfitters rented camping equipment to the group at \$4 a day.

Wadena County businessmen estimate that nearly \$2,000 was spent in the area by this one group, exclusive of gasoline, oil, and other auto supplies.

Based on local expenditures of only \$10 a user the potential benefits from this facility is \$25,000 yearly. Nearby grassland farmers have a new market for hay and pasture. Horse rental enterprises will need to expand. The increasing number of horses in the county provides a growing tax base with property tax at \$5 a head.

In adjacent Otter Tail County, Mr. and Mrs. Marvin Moll and their two sons have developed a small but thriving farm enterprise

serving the tourist trade. They raise and sell strawberries to vacationers attracted by fish-laden Otter Tail Lake. Last year they netted more than \$2,560, providing summer employment and college expense money for the two sons.

Two high school girls and one boy "lived in" to handle the berry sorting and earned about \$300.

For harvesting help, a total of 20 young pickers were paid about \$1,500 in wages. Gasoline dealers benefited from hauling the boys 20 to 30 miles to and from work.

A sideline enterprise by the Moll sons is the balling of conifer trees for sale. They purchase about 25 seedlings yearly, grow and prepare them, then sell them at the farm. In recent years, when the boys are away at school, hired help has been used to carry on the sideline.

Such resource developments in agriculture complement the tourist trade, create jobs, and provide a broader tax base. Chamber of Commerce and other studies show that a dollar produced locally multiples three to four times in community benefits.

At the opposite corner of the project, in Swift County-Apple-

ton area, is a well-established sugar beet enterprise. Forty to forty-five growers produce 72,000 tons of beets annually, having a gross value in excess of \$1 million.

More new jobs

As many as 200 families move in during summer and early fall to work in the beet fields. They earn \$300,000 in wages, much of which is spent locally for groceries, supplies, and other necessities.

During harvest, fleets of trucks haul the beets to the Appleton railroad collecting yard. More than 100 trucks are owned by the growers, and local drivers are hired for a 3-week period at \$1.50 an hour. Community-generated income from this trucking force is estimated at \$30,000. In addition, five men are kept busy at the collection point weighing, unloading, and piling the beets.

The Milwaukee Railroad Company, under contract with the Crystal Sugar Company, makes 3 trips a week for a 30-day period hauling more than 100 carloads a trip to the refinery at Chaska.

At Benson, Minn., a new alfalfa dehydrating plant will be in production this year, creating a new market for 3,500 acres of alfalfa.

The Benson Chamber of Commerce and civic leaders were successful in raising \$60,000 locally through the sale of debenture bonds at \$500 each to farmers and townspeople. Then, they obtained a Small Business Administration loan of \$230,000.

Construction of the plant results in community income from property sales, materials and supplies, labor, and machine hire. Added real estate tax income of \$7,500 is anticipated.

During the peak season the plant will employ 16 to 20 persons; 4 will have permanent jobs.

These and other activities illustrate how resource conservation, development, and utilization contribute to the economic well-being of rural America. ♦

Watershed Dams Bring Solution to Stubborn Gully Problem

TO GET excess water safely off the farm, you first provide a stable outlet at the farm boundary. Verl Adams and his conservation-minded neighbors have known this all along.

But they still had to wait 10 years to take this important first step.

Now, thanks to their Crooked Creek Watershed Project, they can put in all the grassed waterways they need on their own farms and know they'll stay put.

Verl, who lives near Anita in Cass County, Iowa, was one of the landowners with a particularly bad situation. A road-eating gully caused by surface water from a large drainage area plus regular flow overland from a broken tile line was a hazard to both the Adams farm and a county road.

Verl shaped the gully 10 years ago to spread the water out and reduce gouging. In the succeeding years he and neighbors Paul Benensee and Pete Kelloway installed 6 miles of terraces, three stock-water ponds, and 10 acres of grassed waterways on their farms.

It was a losing battle for Verl, though, as any lateral channels he attempted to put in grass would gradually unravel from the bottom. The gully became larger and more of an eyesore with each passing year. Road maintenance was costly, too.

The coming of the Crooked Creek Watershed Project was the solution for this problem and others similar to it. In addition to pooling the efforts of many farm landowners, the project brought in the Cass County board of supervisors, Rural Electric Cooperative, and others with some interest in protection from water damage or better use of rainfall in the watershed.

The Soil Conservation Service

planned a structure for the Verl Adams farm, 1 of 28 to be installed with Federal money. The board of supervisors removed an old wooden bridge and replaced it with a crushed rock crossing.

The concrete structure, which is 10 feet high, provides a good tile outlet and a firm, stable outlet for the grassed waterway at the farm boundary.

Harlan Gettens, Cass County supervisor, believes the improvement

will save the county several hundred dollars annually and perhaps even save a life. He pointed out the opportunity to widen and reshape the road and beautify the area which, he said, means a lot to the county administrators.

As for Verl Adams, he believes in eternal vigilance. "It looks like we have the gully whipped," he said, "but I'm still going to keep an eye on her."

Once an earthmoving contractor himself, he views Nature's powers of wind and water erosion "with respect" and advises others to do the same.—DON FREVERT, *Civil Engineer, SCS, Audubon, Iowa.* ♦



An active roadside gully (above) running beside Verl Adams' barn is stabilized by the structure installed as a part of the Crooked Creek Watershed Project.





After the flood . . .

Many Work Together to Mend Damaged Illinois Farmland

By Hampton H. Long

Area Conservationist, SCS, Macomb, Ill.

WHEN the Mississippi broke through the levees last spring near Quincy, Ill., it took quick work and cooperation by many to restore the heavily damaged agricultural land.

On April 17, floodwaters raced through levee breaks and covered 24,000 acres in the Adams County Soil and Water Conservation District. The water was 2 to 12 feet deep.

When the water finally receded in May, the area was a scene of desolation—buildings severely damaged or completely gone; scour holes everywhere; drainage ditches completely filled in; and 5 inches to 5 feet of sand covering \$500-an-acre farmland. Damage to 181 farm homes, roads, fences, and crops amounted to \$3 million.

USDA agencies in action

Representatives of the Agricultural Stabilization and Conservation Service, Soil Conservation Service, Cooperative Extension Service, and the Adams District met immediately to map out plans for the large job ahead in the dis-

tressed area. They traveled throughout the area to survey the damage and needs for repair and treatment.

SCS made arrangements for technical assistance, ASCS for the needed emergency practices and cost-sharing funds, Extension Service for publicity on the emergency program and advice on cleanup

and sanitation, and the Adams District for help in coordination and determining priorities.

Assistance was offered on ditch cleanout, cropland restoration, farm levee repair, and debris removal. The response was heavy—and quick. Nearly 160 requests for help were turned over to the SCS office at Quincy. Work Unit Conservationist Giles Carr and Conservation Technicians Lowell Schwada and Steve Yates got started immediately.

The first step was to map all areas covered with sand. Soil borings were made by Les Bushue, area soil scientist, and Carr drew a precise map of each area. The map showed the size of the area, the sand depths, and the original soil composition.

Flood-strewn debris lay everywhere (below) and most fields were covered by a thick layer of sand (top).



Each map was studied to determine how best to move the sand, how far, and how much. Carr also had to determine if the original soil was such that sand could be added to it, and how much in each location.

Moving the sand

Three main procedures were developed to deal with the sand:

Areas with more than 3 feet of deposits were considered a total loss, since it was not economically feasible to move the sand.

In areas covered 1 to 3 feet deep and where the haul would be short, bulldozers were used to move the sand to scour holes, old depressions, or to unaffected parts of the field. This operation left from 10 to 12 inches of sand to be incorporated into the soil.

A large 5-foot moldboard plow pulled by two tractors and set to plow 32 to 36 inches deep was used to turn the sand under. As the plow moved along slowly, most of the sand slid down the furrow and was covered to a depth of 2½ to 3 feet.

In other areas where the sand cover was shallow, a land leveler was used to spread the deposit in an even layer about 4 inches deep. This was then plowed under with a 6-bottom plow set to plow about



Large plow is used to turn sand under, mixing it with the original soil. Work Unit Conservationist Giles Carr is at right.

12 to 14 inches deep, providing a good mix of the sand with the original soil.

In many cases, the sand actually improved the internal drainage of the soil.

All together, Carr and his staff were responsible for the technical phases of restoring about 500 acres of damaged bottom land to its original value.

Ditches cleaned

In addition, they surveyed and supervised the cleaning out of 27 miles of farm drainage ditches.

In some cases, the ditches had completely disappeared. Draglines were used in removing most of the silt and sand.

The U. S. Army Corps of Engineers repaired the main levees and now is raising them 3 to 4 feet to provide more protection.

Another flood of this size may be a long way off; but when it comes, agencies and district leaders will be ready to step in and work together to get agriculture back on its feet. ♦

USDA Offices Aid Sale of Recreation Permits

Field offices of three USDA agencies are helping promote sales of the new \$7 Federal Recreational Permit.

The permit—a wallet-size card this year instead of a bumper sticker—will admit a carload of visitors to any of more than 7,000 Federal recreation areas across the Nation. Purchasers also can use the permit when entering an area by bus or on foot.

Forest Service and Agricultural Stabilization and Conservation Service offices have the permits for sale. SCS offices have information about the permits and where to get them. ♦

Plowed field will regain its former productivity, making farming possible again on the flood-ravaged land.



Planning Makes Louisiana Course a Champ in Golf and Land Use

By John M. Cross

Assistant to State Conservationist, SCS, Alexandria, La.

OF THE MILLION people in the metropolitan area of New Orleans, thousands like to play golf. There are five private and three municipal golf courses in the city, plus four more in the fringe area. But you still have to wait your turn to tee off.

That's why a sugarcane field was transformed into one of the newest additions to golfing, and one of the best. How it became one of the best is where the story lies.

Riverlands Golf and Country Club paid Gulf States Land and Industries one whole dollar for 54 acres to establish the original nine holes, at a site one-half mile off Airline Highway (U.S. 90) and 30

miles from downtown New Orleans. Gulf States had acquired the land from Godechaux Sugar Company, which had used it to grow sugarcane.

A map and a plan

The first step in sound and proper conversion of cropland to another use was the development of a soil and water conservation plan based on a soil survey of the area and interpretations of this survey. As a cooperator with the Crescent Soil and Water Conservation District, the club received soil survey information and help in developing a conservation plan and in applying practices called



One of the 700 golfers who visit Riverlands each week tees off on the new recreation facility.



for in the plan.

The land had a drainage system installed—for sugarcane. But you don't play golf across split ditches and quarter drains. That's what led directors at Riverlands to the Crescent District. Stafford Thibodeaux, SCS work unit conservationist assisting the district, is a golfer himself. He figures that proper drainage, whether for golf or sugarcane or any other use, is essential.

The first thing Thibodeaux and his crew did was take a look at the soils map. It helped them locate possible sites for greens and tees, indicated which soils would need draining, and where the pattern of soil differences would help in locating such things as rest areas, practice areas, and shelters.

Thibodeaux' fluency in both golf and conservation enabled him

John Schneider and Stafford Thibodeaux inspect a thick cover of Tifton 328 bermudagrass on one of the greens at Riverlands.

to suggest a course layout combining proper use of soils and drainage patterns with good fairway direction and length and green and tee location.

Every fairway at Riverlands is pointing down a "crown"—a low ridge with flat ditches along the side. The crown empties into laterals, also shallow and flat, to lead the water away into drainage mains off the course. The ditches are designed with $7\frac{1}{2}$ to 1 side slopes to allow play from anywhere on them.

Greens were located on the highest spots so they would not interfere with the drainage pattern.

Grass and trees

The Crescent District furnished the club enough Tufcote bermudagrass to plant a nursery plot, from which sod was taken to cover the tees. The club bought Tifton 328 bermudagrass to sod each green and seeded every fairway to common bermudagrass.

The club bought pine trees from the Louisiana Forestry Commission, other species from local nurseries, and set rows between each fairway and in odd areas. Besides adding functional beauty, the grasses and trees serve to control erosion.

Riverlands qualifies as a championship course, attesting to the care taken in its design and layout.

The club bought another 73 acres of sugarcane land and now has 18 holes. On the latter half Thibodeaux designed a small lake to fit into the course. Soil from the lakesite was taken to build the greens and tees, leaving a thing of beauty and a bad trap if you happen to hook or slice a drive.

The old plantation tenant house on the back nine is now the temporary clubhouse. A new one, located to conform to the drainage and fairway pattern, shows in the

conservation plan as a future development.

Cropland diverted

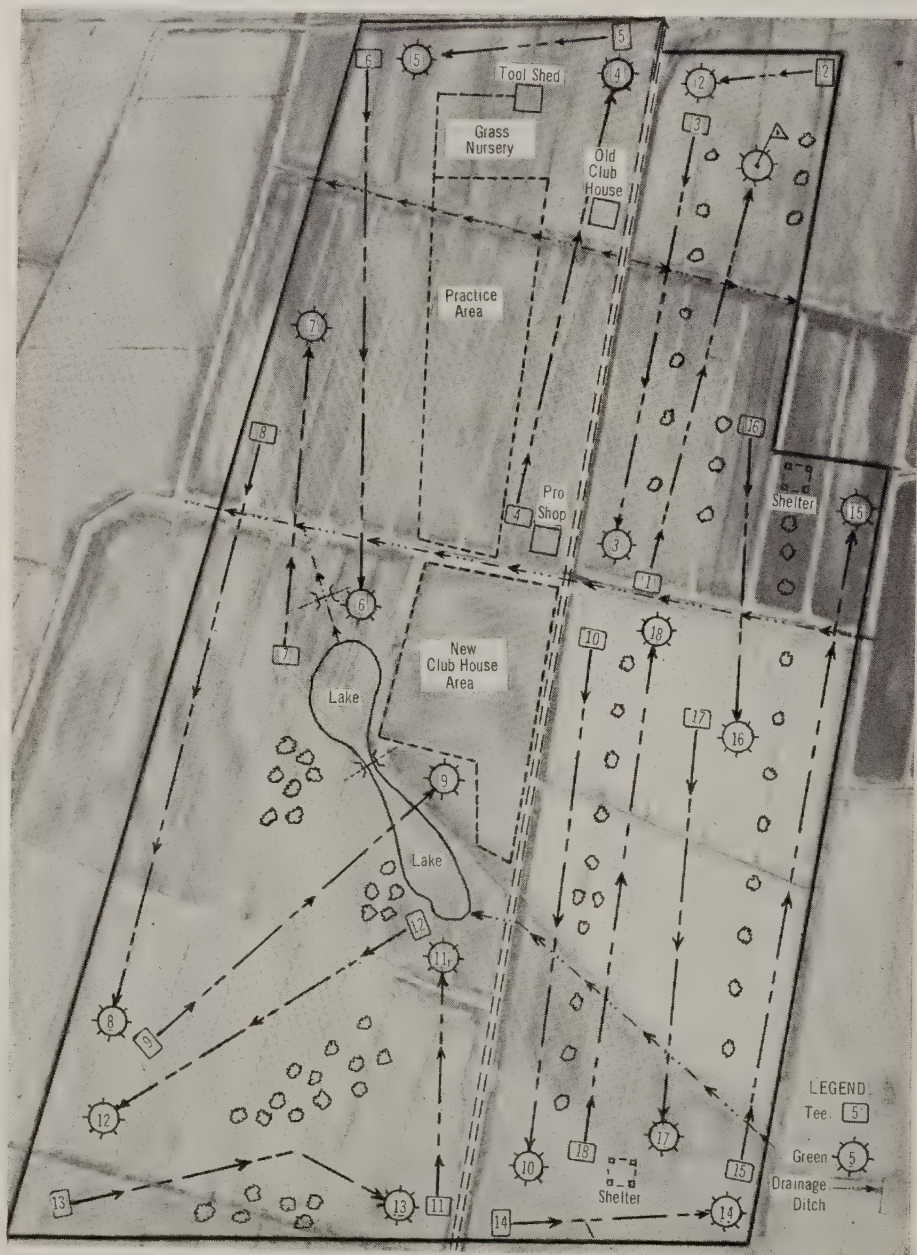
Diversion of 123 acres of cropland into recreation and the application of conservation practices to fit the need are not the whole story of New Orleans golfing, however.

Conservation pays—on the farm or the golf course. Out at Riverlands, which has reached its maximum membership in just 4 years, 700 people each week see the footprints of conservation. More than 4,000 each week play the city park

courses, as many as 1,500 on a weekend.

Some private clubs in New Orleans charge \$1,200 initiation fee, \$67 a month, and \$5 green fee. Even at these prices, the pressure for golfing room may get worse on the sugarcane field.

"They can play our course within 30 minutes after a rain," says John Schneider, golf pro at Riverlands. "The quality of the course as a whole would not have been as good if we hadn't given attention to drainage, soils, and planning." ♦



Layout of the 127-acre Riverlands Golf and Country Club course superimposed over the former canefields.



Wagons on the Prairie

Kansas farm couple revive old Butterfield wagon-train days for recreation profit

By Jack W. Walstrom and Howard V. Cheney

Biologist and Work Unit Conservationist, SCS, Salina and Gove, Kans.

THE CRY of "Wagons Ho" once again echoes across the western Kansas plains as covered wagons move out along the old Butterfield Trail.

"Wagons Ho" is a new income-producing recreation project for Frank and Ruth Hefner of Quinter, Kans.

On the trail

Guests of the Hefners spend several days and nights on the trail, enjoying many varied activities and the quiet beauty of the Kansas prairie.

Potential pioneers usually arrive at a selected campsite the evening before the trip begins. They get to know one another, and the Hefners explain the activities to come. The next morning, it's "Wagons Ho!" And the wagon train starts its journey down the Butterfield

Trail.

A typical day's schedule: Eating a hearty breakfast on the open prairie; riding in a covered wagon, Concord stage, or on a saddle horse; fording a shallow section of the Smoky Hill River; searching for fossils or rocks in prime hunting areas; viewing occasional

cattle herds; being entertained around an evening campfire; and resting beneath a western sky. And somewhere along the way an Indian raid and a visit by a Pony Express rider are sure things.

Good food, and plenty of it, are of course a vital part of the Hefners' western hospitality.

The Hefners, cooperators with the Gove County Soil Conservation District, completed a Great Plains Conservation Program contract on their 2,560-acre farm in 1964. Under the plan, 230,000 feet of terraces and 2 acres of windbreaks were installed, and 83 acres of cropland was converted to grass. With the major conservation work done, they turned their attention



Visitor's view of the wagon train rolling between the Bollinger and Owens farms on the Butterfield Trail.



From the end gate of a covered wagon, this "trail rider" watches the wide Kansas prairie meet the horizon.

to recreation.

An interesting aspect of this 20th Century wagon train is the cooperation the Hefners receive from the many people involved.

Howard Cheney, SCS work unit conservationist, helped determine the original route of the Butterfield Trail, still visible on aerial photographs. He made a list of landowners whose permission would be needed to cross their lands.

Fifty-five landowners and tenants gave the Hefners permission not only to cross their lands but also to use likely areas for campsites and stopping places. Many landowners have become so enthusiastic that they pitch in and help, providing skilled wagon drivers and horsemen for the tour.

The wagon train includes 13 covered wagons, 25 horses and mules, and a stagecoach. The stagecoach, built from the original plans of the Concord Coach Company, has no springs. Concord used strips of leather to cradle the body and absorb bumps. The stagecoach wheels also are authentic, made specially in Arkansas by Mennonite craftsmen. Passengers trade places at each rest stop so that everyone has an opportu-

nity to ride in the Butterfield coach.

As the caravan moves along, drivers and cowboys point out scenes of interest—a homesteader's long-abandoned sod house; the ruts of the Texas cattle trail trampled into the sod by millions of long-horns in the 1870's; and the original stage stations along the Butterfield Trail. Also of interest to the Easterner and all city folk are some of the signs of modern farming—fields reseeded to grass, terraces, and trench silos.

At day's end

After a day that passes all too soon, the wagon train forms a circle at the predetermined prairie campsite. Not far away, behind a grove of trees, is a ranch house that offers a chance for travelers to take a refreshing shower and wash the trail dust off their faces. They do not tarry long, however, because the campfires are lit, and the aroma of food soon fills the air.

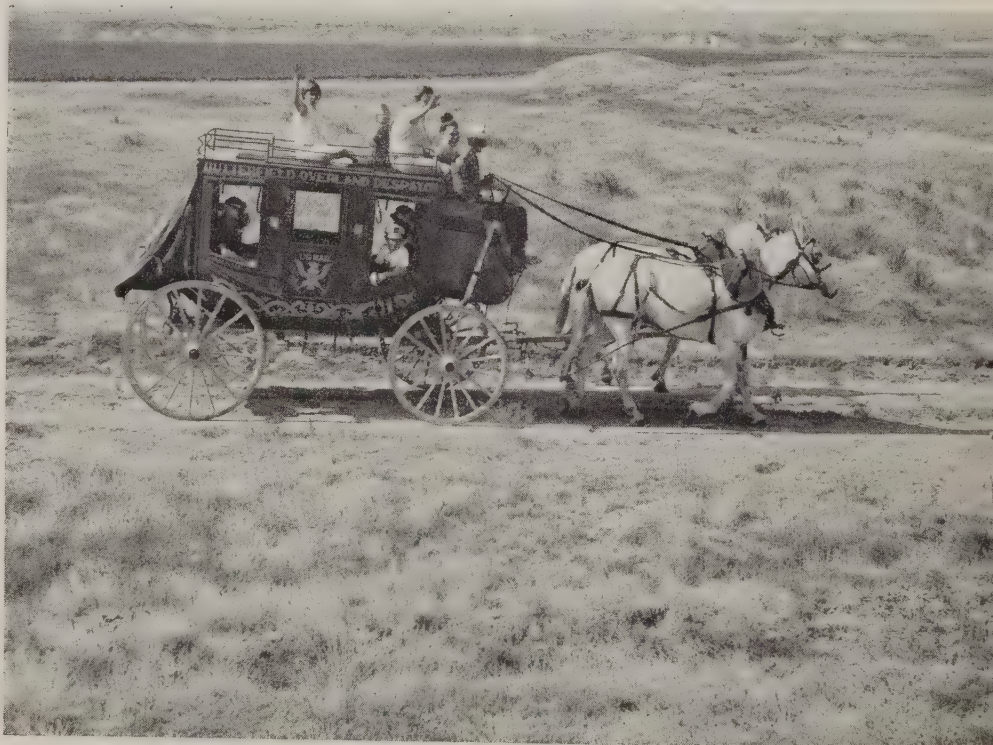
Before the last rays of the sun

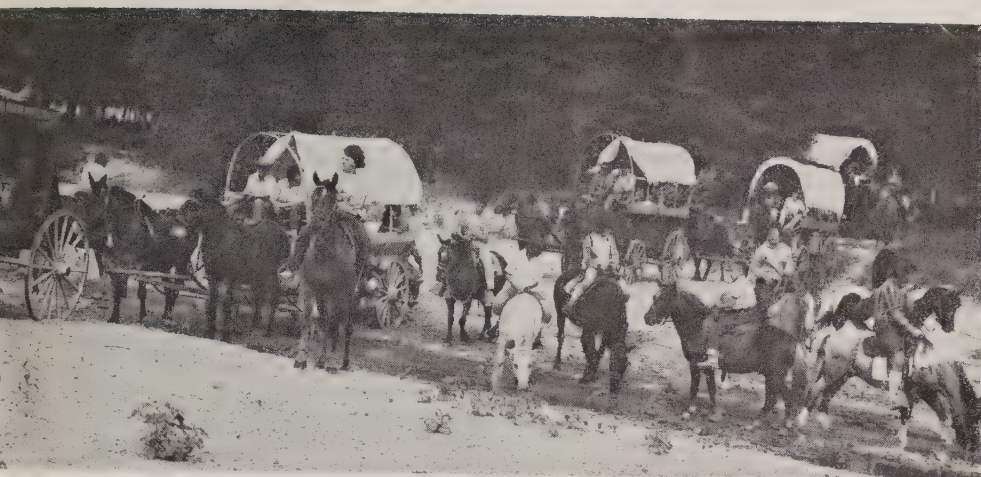


disappear, all hands prepare their sleeping bags. The bags are furnished at the journey's start to make a more comfortable bed under the stars or upon native hay piled high in the wagons. The dark outline of the wagons against the dimly lit western horizon, the smell of campfire smoke, and the sound of whinnying horses truly bring the old West back to life.

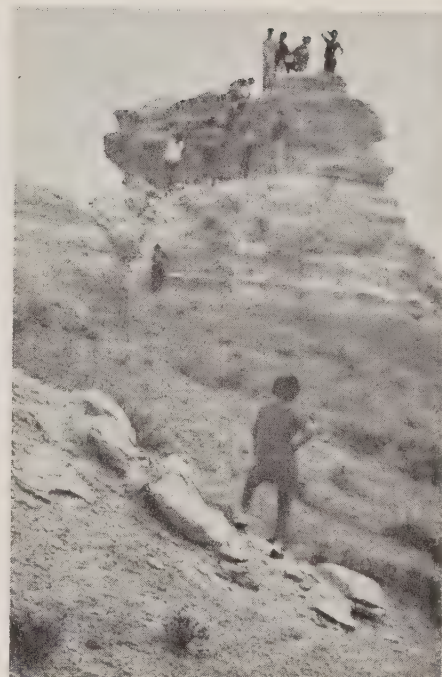
At night, the modern pioneers gather around a campfire and blackened coffeepot to hear western music from guitar and fiddle. Those who want to can dance to

A ride on the specially built stagecoach is a treat for adults and children alike.





The wagon train makes a rest stop at the Smoky Hill River on the Norton farm to water the horses.



Wagons Ho guests search Little Castle Rock for stones and fossils.

their favorite western and polka tunes on the buffalo sod. Others listen to the wagonmaster spin tales of cowboys who camped nearby while driving huge longhorn herds to the northern railroads.

And then the mail

One of the trip's exciting moments comes when a Pony Express rider delivers to each traveler a letter from Wagons Ho. The letter is an invitation to attend a reunion each fall with other Wagons Ho guests. Tourists from the United States, South America, Germany, England, Ireland, and Sweden have already enjoyed Wagons Ho hospitality.

Harry Morris, an airline executive from Middlesex, England, wrote the Hefners, "Our time with Wagons Ho was the most exciting of our trip in the United States. You are to be commended for keeping the heritage of the West alive, for this part of America is known and loved the world over."

Wagons Ho has made 13 trips across Kansas prairie since its beginning 2 years ago. The Hefners so far have come out about even financially, but they expect to realize a small profit this year.

With satisfied guests urging their friends to travel wagon train, the old Butterfield Trail is once again taking more and more "pioneers" west. ♦



After putting the wagons in a circle and eating a hearty evening meal, guests try out the prairie-sod dance floor (above) and enjoy themselves around the evening campfire.



For profit and good land use . . .

Texan Turns to Growing Wildlife as His Only Ranch Crop

By James Henson and Vernon Hicks
Biologists, SCS, Bandera and Temple, Tex.

WILDLIFE harvest long has been an extra dividend from regular farming and ranching operations.

But many landowners in Texas now are shifting to wildlife as a major crop, increasing their income and improving their land in the process.

Charles Hutcheson of Bandera County, a cooperator with the Bandera Soil Conservation District, presents a good example of this land use change and its benefits.

A shift in plans

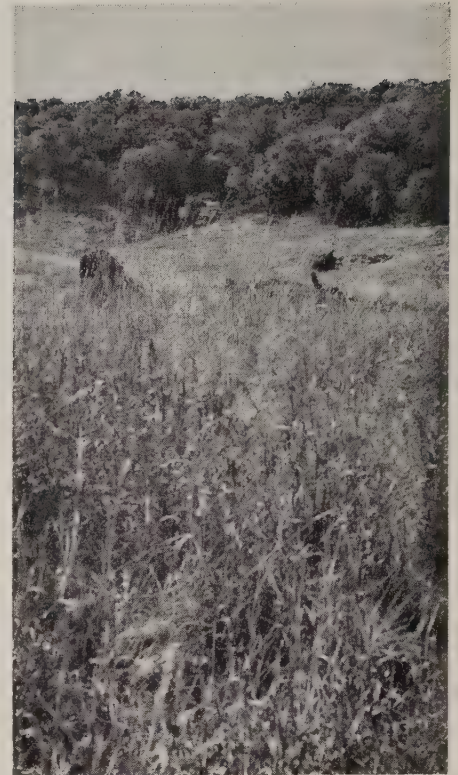
Hutcheson's story began in 1955, when he was carrying out typical ranching operations on his 633-acre ranch—raising cattle, sheep, and goats and about 65 acres of

small grain. His wildlife harvest consisted of 6 to 8 deer and 7 to 10 turkeys a year. The chief returns from his ranching operation were hard work, low dividends, and range deterioration.

Since ranching was returning so little on the investment made, and demand for hunting leases was increasing rapidly, Hutcheson decided to make wildlife his chief crop. He believed this change would bring him more money and at the same time improve his land.

In 1955, he sold all his sheep and goats and all but a few head of cattle. Cropland was converted to wildlife food plots. Brush on the rangeland was cleared in patterns with care taken to leave adequate cover for the deer and turkey.

Strips in foreground and background have been cleared of brush to increase native grasses; remaining brush provides cover for wildlife.



Indiangrass and little bluestem thrive on the cleared strips, providing succulent forage for wildlife.

The reduced load on his range permitted the grass, forbs, and desirable woody plants to improve, providing more food for both livestock and wildlife.

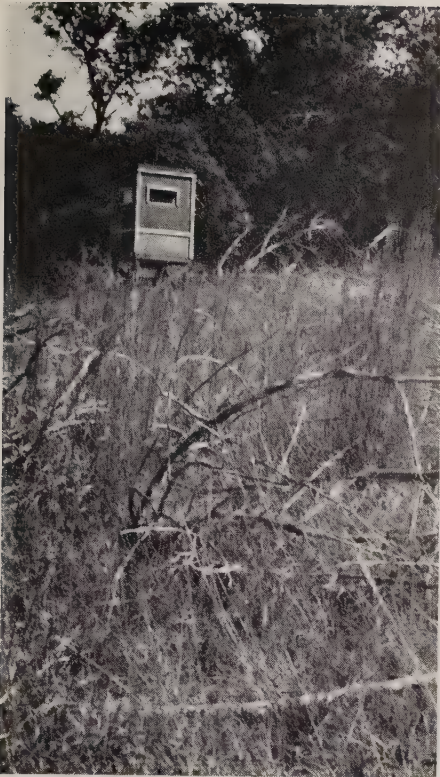
Deer and turkey began to increase, and soon Hutcheson had his new crop—wildlife—well established.

They pay to harvest

Harvesting is not a problem. A group of businessmen from Louisiana has leased all hunting rights. This group returns to Hutcheson's ranch each fall and gladly pays to reap the harvest.

Two years ago Hutcheson sold the remaining cattle and now manages only wildlife—deer, turkey, and an introduced species, mouflon sheep.

Deer and turkey feeders, placed throughout the ranch, are kept full of feed all year. Hutcheson estimates that the wildlife eat about 10,000 pounds of maize and 15,000 pounds of shelled corn each year. Hunters pay the cost of feed



New hunting blind at the edge of a clearing on the Charles Hutcheson ranch makes hunting more comfortable.

and transportation and labor involved in putting it out, plus the expense of planting the wildlife food plots.

The hunters are well pleased with the hunting arrangement Hutcheson provides for them. In 1964, 38 hunters harvested 41 deer, all 6-point bucks or larger, and 20 tom turkeys. Last year approximately the same number of hunters got 73 bucks, 8 does, 20 tom turkeys, and 8 mouflon sheep.

Hutcheson is well pleased with the results of his land use change, too. "Income from the ranch has more than doubled since I sold my sheep, goats, and cattle and started managing strictly for wildlife," he said, "and this is taking into consideration the buying-power of the dollar today as compared to that of 11 years ago."

Soil Conservation Service technicians assisting Hutcheson say that his rangeland is now in good to excellent condition as compared to a very poor condition before the land use change. ♦

Sale of Firewood Improves Woods

SEVERAL YEARS ago fire ruined much of the timber in Lamar Hawk's 150 acres of woodland in Vinton County, Ohio. It was a serious blow, for the woodland had been producing good lumber and some pulpwood.

Not discouraged, Hawk found a market for his burned-over timber, now marginal by most standards. He cuts the timber and sells it for firewood. In this way he has developed a supplemental income from what many would consider a disaster. And he is improving his woodland by removing dead and damaged trees that stand in the way of new high-quality growth.

For the past 11 years, Hawk has been cutting his normally unwanted wood into sizes to suit his customers. Some want it for fireplaces, others for furnaces. He splits most of the wood for easy handling.

Hawk has a 230-acre farm and is a cooperator with the Vinton Soil and Water Conservation District. He farms some of his acreage, drives a school bus during the school year, and in his "spare" time, cuts and delivers the wood in his small farm truck. He uses a tractor and trailer to get the logs from his woodlands to the farm headquarters in the summertime.

"Most of the wood I market for fireplace use is white and red oak, along with hickory, because it gives out a good heat, is low-burning, and leaves a bed of hot coals," Hawk says.

Hawk spends 3 or 4 months each year during his slack season on his wood business. He sells 40 to 60 ricks annually to customers in Chillicothe, 22 miles west of his farm.

"I have no trouble getting customers," Hawk said. "Many of them have standing repeat orders. If I had more time, I could supply even more customers."—WALTER J. DUMECH, *Work Unit Conservationist, SCS, McArthur, Ohio.* ♦

Lamar Hawk unloads hardwood from his farm trailer to lot near his home as he harvests fire-damaged trees.



Roadside Beauty Is Byproduct of Watershed Project

By William C. Lowry

Soil Conservationist, SCS,
Madison, Ky.

ROADSIDE beautification is a growing byproduct of the Line Creek Watershed Project in Monroe County, Ky. Conservation measures along roads there are turning scarred silt-producing roadbanks into grass-covered vistas.

Stabilizing roadside banks with fescue is not new in some sections of this southern Kentucky county, especially along State highways leading through Tompkinsville, the county seat. But the idea, heretofore, has not spread rapidly in remote rural areas.

Nine miles of roadbank stabilization was planned for the Monroe County portion of the Line Creek Watershed Project. The Monroe County Highway Department, the Fiscal Court, directors of the Line Creek Watershed Conservancy District, and the Soil Conservation Service joined forces to stabilize the critical areas.

Twenty-two landowners involved in the planned roadside project contributed their land, labor, and farm machinery. The sponsors provided heavy earthmoving equipment. Needed materials were purchased by the conservancy district with watershed protection funds.

Stabilizing the area consisted of sloping, fertilizing, seeding, and mulching the roadside banks, which varied in height from 4 to 17 feet. The banks were shaped to a minimum slope of $2\frac{1}{2}$:1, fertilized at the rate of 1,500 pounds an acre of 10-10-10 fertilizer, and seeded to 35 pounds an acre of certified Kentucky 31 fescue seed.

The area, totaling 7 acres, was mulched with fescue straw at the rate of 2 tons an acre. It was



The eroding roadbank alongside a farm in the Line Creek watershed (above) was converted into a gentle grassed slope (c.) in a year's time. Multiflora rose (below) adds further beauty along a highway.

seeded in April 1964. Since that time, 5 additional miles of roadside slopes have been established to vegetation by other landowners in the area, according to SCS Work Unit Conservationist David R. Walden.

Reed Conkin, member of Monroe County Fiscal Court in the watershed area, said, "There is a world of difference in maintaining the roads since they have been sloped and stabilized. Work that had taken 5 days to do is now done in 3 days. We hope soon that all of our roads are fixed like these."

"We've had a goal here ever since our district was organized," said Roland Bushong, chairman of the district board of supervisors. "Our long-range program includes beautifying the view along all public roads in Monroe County, whether it be with grass or other vegetation."

The Monroe County Soil Conservation District was organized in 1945. It is estimated that more than 100 miles of roadside slopes have been vegetated through the cooperative efforts of the highway departments, landowners, and the soil conservation district.

Lankford Copass, chairman of the Line Creek Watershed Conservancy District, remarks, "The need for vegetative cover to control erosion and pride in the countryside have led us to improve the looks of our main roads for years; now we are beautifying our secondary county roads too." ♦

Great Plains Program to be Evaluated

USDA's Economic Research Service plans to study the effects of the 10-year-old Great Plains Conservation Program on the conservation of soil and moisture, on the people on farms and in the towns, and on living standards throughout the 10 Plains States.

This study by arrangement with the SCS will be conducted under the direction of W. B. Back, head

of Resource Income Studies of the Resource Institutions Branch, ERS.

Field Supervisor Norman E. Landgren with headquarters in Fort Collins, Colo., plans to map areas of concentrated use of the program, and teams of interviewers will aid him in gathering information on the program's effects. The agricultural colleges in the Plains will also assist in this study.

Indian Corporation Signs Agreement

MENOMINEE COUNTY Soil and Water Conservation District, Wis., supervisors recently signed a single cooperative agreement that brought 93 percent of the land in Menominee County under agreement.

Menominee County is an area of 233,902 acres. Menominee Enterprises, Inc., owns 225,000 acres of this land.

Menominee Enterprises, Inc., is a private corporation formed at the time the Menominee Indian Reservation was terminated on May 1, 1961. The Indian people are the stockholders in the corporation which was founded to conduct their business affairs.

Leo Kohls (l.), chairman of the Menominee County District, and George Kenote, representing Menominee Enterprises, sign a conservation agreement covering the corporation's holdings.



More than 218,000 acres of the Menominee land is in commercial forest. It includes some of the largest white pine and hardwood timber in the Lake States area.

Under the district conservation agreement, the forest will continue to be managed on a sustained yield basis with guidance from the Wisconsin Conservation Department forester. The present allowable cut is 30 million board feet a year.

SCS will provide technical assistance to the corporation in developing the recreation resources of the property, which includes 300 miles of trout streams and many unspoiled lakes.

Jerry Grignon, chairman of the board of directors, says, "We need to develop and use our water resources to improve our economy. Careful planning is essential to protection of these resources." ♦

Rural Districts Theme of Meeting

Rural development districts and the demonstration cities program are among topics featured in the County Regional Problems Congress, 31st annual conference of the National Association of Counties, in New Orleans, La., July 17 to 20.

Keynote speaker is Marion Folsom, former Secretary of Health, Education, and Welfare. Other speakers include Louisiana Governor John McKeithen, New Orleans Mayor Victor Schiro, Office of Economic Opportunity Director Sargent Shriver, and Undersecretary Robert Wood of the new Department of Housing and Urban Development.

Elected and appointed county officials from across the country will attend and participate in discussions on the regional aspects of almost every county activity. The war on poverty, mass transit, and medical care for the aged also have featured places on the program. ♦

"Beauty" Series Prints for Sale

(Photo on p. 288)

THE POPULAR "America the Beautiful" photo series now can be purchased—\$5 for the whole set of 52 or individual pictures at \$0.10 apiece.

Several years ago the Soil Conservation Service assembled a series of striking natural-color photographs that show the great natural and manmade beauty of America's conservation-treated rural lands.

The series of large prints, one from each State, Puerto Rico, and the Virgin Islands, has been displayed throughout the Nation at fairs and other public events; in banks and businesses; and in the lobby at Dulles International Airport near the Nation's Capital. Individual prints grace the walls of several offices in SCS' national office and elsewhere.

As demands for copies of the relatively expensive photographs increased, SCS made arrangements with the U. S. Government Printing Office to make lithographic prints of the series that could be bought at low cost.

All 52 photographs now have been reproduced and are available from the Superintendent of Documents, Washington, D. C. 20401. The pictures, in full color, measure 15 by 20 inches, printed on 20-by 24-inch paper. They are suitable for framing and hanging in homes, schools, offices, and business establishments. Order blanks can be obtained in local SCS offices and in many post offices. ♦

Soil Colors for Carpets

To incorporate the color of soil in their carpet patterns, manufacturers of carpets have asked SCS for help in determining the general soil colors in different geographic regions of the United States. This information is now in SCS soil survey reports. ♦



Simon Britt (r.) consults with SCS Work Unit Conservationist Albert Boyd about his farm pond under construction in the background.

Cooperator Builds Multipurpose Pond

A multipurpose pond on the farm of Simon Britt, a Negro cooperator in the Chipola Soil Conservation District, Fla., will provide water for his livestock and recreation for his family and neighbors.

Mr. Britt has been a district cooperator since 1941. He serves on the Jackson County Rural Area Development Board.

He operates a 192-acre general farm of his own, farms another 120 acres belonging to his sister, and helps a brother who lives several miles across the county. ♦

SCS Enters Work-Study Program

THE NATIONAL headquarters of the Soil Conservation Service is using students of Howard University, Washington, D.C., in a work-study project under the Economic Opportunity Act.

Part-time on-the-job experience will be provided for 10 students in civil engineering, geography, mathematics, business administration, drafting, biology, and cartog-

raphy, under an agreement signed with the university. SCS is the first agency in USDA to undertake such a program.

The first participant, James McWilliams, entered on duty April 25, in the Washington office helping to examine vouchers submitted for payment. Others will work in Washington and at Hyattsville, Md. ♦

Dean Carl F. Anderson of Howard University signs the memorandum of agreement establishing the work-study project with the Soil Conservation Service. Mrs. Goldie W. Claiborne, director of the financial aid office at the university, approves the action as SCS Administrator D. A. Williams (l.) and special assistant James F. Hughes look on.



Pan American Soil Congress Names Permanent Commission for Future

LOOKING toward the holding of a second Pan American Soil Conservation Congress, delegates to the First Congress in Sao Paulo, Brazil, elected a 5-man commission "to foster and coordinate soil conservation activities in the Western Hemisphere after the termination of the present Congress."

Nearly 500 conservationists from countries throughout the Western Hemisphere attended the 18-day meeting April 12 to 29. About 150 technical and general papers were presented and will be published in the proceedings.

Secretary of Agriculture Orville L. Freeman officially opened the formal program on April 16. SCS Administrator D. A. Williams headed the official United States delegation and opened the plenary sessions the following Monday.

The congress was sponsored by the Government of Brazil and the State of Sao Paulo. Joao Abramides Neto of the Sao Paulo

Ministry of Agriculture was general coordinator. Roy D. Hockensmith, chief of soil survey operations, SCS, assisted with the arrangements.

Four days of field tours were held prior to the official opening. Visits were made to coffee and sugarcane plantations and to other agricultural and urban developments in the State of Sao Paulo.

Mrs. Hugh Hammond Bennett, wife of the first chief of the Soil Conservation Service, accompanied delegates on the tours and was given special recognition in honor of Dr. Bennett's work in Brazil.

Members of the permanent commission are: Jose Betroni, Institute of Agronomy, Campinas, Sao Paulo, Brazil; Gladstone W. Morgan, University of the West Indies, Kingston, Jamaica; H. Wayne Pritchard, executive secretary, Soil Conservation Society of America, Ankeny, Iowa; Julio Ipucha Aguerre, Institute of Soil and



Mrs. Hugh H. Bennett with Roy D. Hockensmith, SCS, during the flag-raising ceremony at the Fazenda Jussara (farm) near Rio Clara, Sao Paulo, Brazil.

Technical Agriculture, Buenos Aires, Argentina; Manual Paulet Iturri, Agrarian University, La Molina, Lima, Peru.

Berton was elected president of the commission; Pritchard was named secretary.

The commission's charge

The commission was charged to:

"1. Transmit recommendations of this congress concerning future soil conservation activities to the appropriate international agencies, country governments, and non-governmental institutions.

"2. Receive and assess the responses of the above-mentioned bodies.

"3. Promote action by country governments to bring about an agreed upon program of soil conservation activities.

"4. Obtain the agreement of country governments concerning the appropriate administrative agreements.

"5. Make arrangements for future congresses, workshops, etc., as agreed between country governments."—H. WAYNE PRITCHARD, Executive Secretary, Soil Conservation Society of America, Ankeny, Iowa. ♦

Technicians from two continents engage in intense conversation. They are Haroldo Monteiro da Silva (l.), engineer-agronomist with the Soil Conservation Service of Sao Paulo, and LaVerne Anderson, work unit conservationist, SCS, Howell, Mich.





CONSERVATION PROFILE

W. P. Cater New Mexico

Rancher-statesman sparks strong resource efforts

THE LIFE and accomplishments of W. P. "Bill" Cater of Questa, N. Mex., are proof that inspired local leaders can change the economy of an area and improve the lives of people through soil and water conservation.

As a longtime rancher, soil and water conservation district supervisor, State districts association president, and State senator, he has been in the forefront in bringing steady resource and community improvement in New Mexico through many changes in needs and opportunities.

Cater is an oldtimer in Taos County ranching. He came there about 40 years ago. The Cater ranch lies at an elevation of 6,500 to 8,000 feet, near the New Mexico-Colorado State line, where rainfall averages 12 to 16 inches a year and the growing season is short. He and his brother depend on cattle, hogs, grain, and hay from their 7,500 acres of rangeland and 500 acres of irrigated pasture for the family's income.

Battle with brush

During Cater's early years on the ranch, he observed that only 10 to 50 percent of the forage potential was being realized from the native rangelands of the Taos country. Formerly good grassland was covered with sagebrush and nonpalatable shrubs. Forage yields were as low as 40 pounds

of native grass an acre in a normal year.

Cater tried controlling the brush and reseeding with crested wheatgrass on his ranch and raised grass yields to as much as 1,500 pounds an acre. This successful experience led him to establish 20 acres of crested wheatgrass for seed-increase in the fall of 1943.

It was the beginning of a new era in the ranching business of his section of the State. Since that time, more than 75,000 acres of sagebrush land has been cleared and much of it seeded to crested wheatgrass.

Cater was elected to the Taos District board of supervisors in 1947 and has been a supervisor ever since. He served as chairman of that board in 1954 through 1962 and again in 1965. The Taos District was named the outstanding district in New Mexico in 1956.

During Cater's service as district supervisor and State senator, he became deeply concerned with the economic well-being of New Mexico's people, who depend in large measure on the use of natural resources for a livelihood. Farming and stock raising have always been of major economic importance to the people of New Mexico.

Economic development

What concerned Cater and other farsighted resource leaders was the poverty of many northern New Mexico families who are depending on too-small farm units with undependable supplies of irrigation water; growing crops according to traditional rather than scientific methods; and grazing depleted rangelands with poor-quality cattle. Misuse and underutilization of resources were reflected in poor schools, poor roads, poor nutrition, and an apathetic people.

Clearly, there was great need for stepped-up economic development of a broad area of northern New Mexico. But where to start?

The enabling act for Resource

Conservation and Development Projects, enacted in 1962, provided the vehicle for State and local leaders to pool their efforts with agencies of the Federal Government, under leadership of the Soil Conservation Service, for resource improvement and economic rehabilitation of large areas.

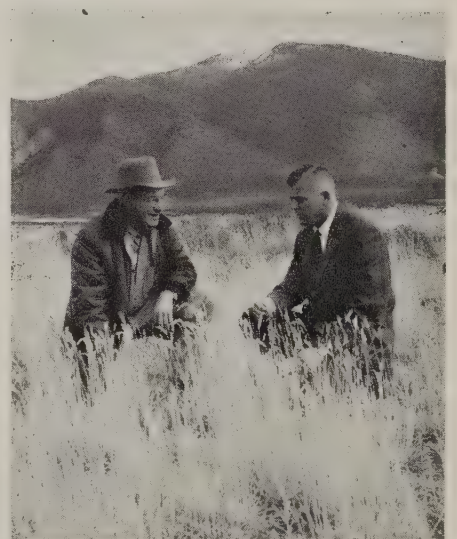
Cater was the real "spark plug" in getting 24 sponsors—including conservation districts, county governing bodies, cities, villages and towns, State governmental agencies, and private organizations—to work together in the 2.8 million-acre Northern Rio Grande RC&D Project.

The success of a project rests on results. Since its initiation in 1964, loans for agricultural development have more than doubled. Improvements completed on community ditch systems benefit about 900 farmers. Work done on projects to date has provided 36,500 man-days of employment. Dollar income has increased by \$398,000.

Cropping systems are changing, and new marketing facilities have been built. A new wood processing plant has been constructed. Of the 33 group conservation jobs in the State during 1965, 26 were in the RC&D project area.

Although Cater's early interests

Bill Cater (l.) shows some of his crested wheatgrass pasture to SCS State Conservationist Einar L. Roget.



centered in the northern New Mexico district he called home, his influence soon spread across county and district boundaries and throughout the State. He was elected vice president of the New Mexico Association of Soil and Water Conservation Districts in 1952 and served as vice president from 1953 until 1962. In 1962 he was elected president and has held the office since that time.

Bill was elected chairman of the New Mexico State Soil Conservation Committee in July 1965.

Conservation leaders, with Bill Cater in the front, have generated strong support from the State legislature in securing a broader legislative mandate to meet growing resource conservation needs. In 1965 the State legislature revised the districts law and gave broader representation to all segments of the population, urban as well as rural. The legislature appropriated \$80,000 of State funds for watershed planning by SCS. The rate of watershed planning under Public Law 566 has nearly doubled as a result of financial participation by the State.

The unselfishness of Cater's public service is underscored by the fact that most of the posts of community and statewide service that he holds pay no salary. He has paid much of his travel expense from his own pocket.

Bill Cater is a dedicated rancher-conservationist who is concerned about the well-being of his fellow man and who is doing something about it. ♦

Sagebrush Control

In the past 30 years sagebrush has been controlled successfully on 5 to 6 million acres. More than half this acreage has been treated during the past 5 years. It is evident that the practice is gaining momentum and will be applied to many more millions of acres in the West. ♦

Governor's Tour Sees Progress in Conservation

THREE Minnesota governors have toured many hundred miles of country roads the past decade to view soil and water conservation problems and progress in the State.

They have done so through the Governor's Conservation Tour co-sponsored by the State Association of Soil and Water Conservation Districts and the State Soil Conservation Committee.

The tour has been helpful in many ways. Frank Crippen, State committee chairman last year, says it helps promote sound conservation legislation because the governor and other high State officials learn the principles of soil and water conservation.

It also gives the governor an opportunity to talk with the land owners and operators who apply conservation practices. Thus he sees firsthand how Federal and State agencies work with local soil and water conservation districts.

The governor also makes speeches and dedications along the way which helps the districts gain recognition for their resource planning and development work.

The first tour was held in 1956 during Orville L. Freeman's governorship. Since then, Governors Elmer L. Andersen and Karl F. Rolvaag have also toured conservation practices across the State. Governor Rolvaag has become so interested during his 3 years as governor that he has asked for a tour each year.

Many persons participate in the tours besides the governor. In addition to members of the State Soil Conservation Committee and representatives of the State Association of SWCD's the tour last October 19-21 also included the

State Commissioner of Agriculture, the Commissioner of Conservation, district supervisors, the State Conservationist, Extension Service representatives, State and county ASCS committeemen, plus local legislators and mayors. ♦

Youth Conference on Conservation

SOME 500 delegates from 10 youth organizations throughout the country participated in a Youth Conference on Natural Beauty and Conservation in Washington, D. C., June 26 to 29.

George Fox, FFA member from West Lafayette, Ind., was chairman, and Jacqueline Sharp, a Girl Scout from Jackson, Miss., was cochairman.

The conference was a followup on the 1965 White House Conference on Natural Beauty in an effort to involve youth groups in conservation needs and planning.

In accepting a Girl Scout offer to sponsor the meeting, Mrs. Lyndon B. Johnson said, "This is one of the most exciting ideas, of great potential, that has come my way."

Besides the FFA and Girl Scouts, the youth organizations represented were the Boy Scouts, Camp Fire Girls, Boys' Clubs of America, YMCA, and YWCA, 4-H Clubs, Future Homemakers of America, Girl Clubs of America.

Serving as coordinator was Miss Elizabeth Mason, formerly director of women's activities for the U. S. Forest Service.

The conference program included talks by leading conservationists, group discussions, and panels on such conservation problems as water resources and water-fronts, antilitter problems, "how-to-do-it" guidelines, conservation education in natural resource problems, roadside improvement and highway building problems, city beautification, air pollution, and open space problems. ♦



Water. BY LUNA B. LEOPOLD, KENNETH S. DAVIS, AND THE EDITORS OF LIFE. 1966. *Time, Inc., New York. Life Science Library.* 200 pp., illus. \$3.95. School and library distribution by Silver Burdett Company, Morristown, N. J.

In the familiar format of the *Life* "Libraries," this handsome book makes a complex subject understandable to the general reader and to school students by a happy combination of simple text and expressive photographs and drawings.

Professional hydrologists and conservationists, however knowing of the statistics and problems of water supply and management, will find interest in the basic explanations of familiar facts in the chapters on the physical properties of water, the hydrologic cycle, ground water, erosion, and biological function. Problems of water use and conservation are summarized with equal effect.

Life's Editors have thoroughly canvassed the Nation's authorities on the subject to gather and verify the contents of the book. A half page of acknowledgments lists upwards of 50 individuals representing government agencies (including SCS), universities, and private institutions concerned with water.

The authors, chief hydrologist of the U. S. Geological Survey and a prominent author, both worked early in their professional careers for the Soil Conservation Service in the Southwest, where water scarcity is an ever-present fact of life. Abel Wolman of Johns Hopkins University, another well-known water authority, provides the introduction.

The book, like others in the series, is available to individuals

only on direct order from the publisher.—B.O.

Consumers All: The Official Consumer's Guide. BY THE U. S. DEPARTMENT OF AGRICULTURE. 1965. *Pocket Books, Inc., New York.* 496 pp., illus.; paper. \$1.50.

The widespread appeal of the consumer information in the 1965 *Yearbook of Agriculture* has led to its being reprinted in its entirety by a commercial publisher. Except for its title page and cover, the book is an exact reproduction, slightly reduced in size, of the original.

New Publications

The Population Challenge. 1966. U. S. Department of the Interior Yearbook No. 2. 80 pp., illus. \$1.25. This combination annual report and conservation lecture continues the large format and lavish use of color illustrations ("made possible through the loan of color separations of previously printed pictures") introduced by the Department of the Interior in its 1965 yearbook, *Quest for Quality*.

The programs and some of the activities of the Department's various agencies and offices are described in relation to the growing pressure of population on resources.

The argument is strongly reminiscent of the Department of Agriculture's "fifth plate" theme of 25 years ago. But, says the report, "The difficulties we face are not so much scientific and technological. Rather, they have largely to do with social philosophy and the will to organize for the general welfare. A wider and deeper dialog on social purposes is necessary to break the moral, political, and economic bottlenecks to a better life for everyone. It is this Department's responsibility to contribute to this dialog with reports to the people on its efforts to improve the outdoor environment, to protect our wildlife, to help eliminate litter and junk from the American landscape, to better manage our water, to stretch our fuels and minerals, and generally to maintain and strengthen our country's resource base."

Wild Ducks on Farmland in the South. BY WILLIAM W. NEELY AND VERNE E. DAVISON. 1966. *USDA Farmers' Bul.* 2218. 16 pp., illus. \$0.10. Superseding Farmers' Bulletin 2144, "Managing Farm Fields, Wet-

lands, and Waters for Wild Ducks in the South," this bulletin presents suggestions on establishing and managing duck fields; selecting and planting duck food, with a table evaluating some duck-food plants; building ponds, utilizing reservoirs, brackish-water areas, and marshlands; and hunting.

Farm and Ranch Vacation Guide. EDITED BY PATRICA DICKERMAN. 1966. *Farm Vacations and Holidays, Inc., New York.* 96 pp., illus. \$1.50. Mainly a listing of facilities and rates of farms and ranches offering "vacation" services. These facts, as well as the suggestions to vacationers and testimonials of clients included in the book, should be helpful to operators considering a venture in the farm vacation business.

Rural Areas Development at Work. 1966. *USDA PA 625.* 32 pp., illus. Gives concrete examples from all over the country showing how Rural Areas Development program helps rural people use Federal and State programs to create new jobs and develop needed facilities.

Restoring the Quality of Our Environment. BY THE ENVIRONMENTAL POLLUTION PANEL, PRESIDENT'S SCIENCE ADVISORY COMMITTEE. 1965. *The White House.* 317 pp. \$1.25. This report, the subject of the lead article in *Soil Conservation* for April, is now available from the Superintendent of Documents.

Protecting the Forests From Fire. 1965. *USDA Agr. Inf. Bul.* 130, rev. 30 pp., illus. Hints on fire control and firefighting methods and a list of historic forest fires.

Conservation Highlights, 1965. 1966. *USDA 2-fold folder.* Digest of the progress report of the Soil Conservation Service.

Soil Surveys

Alameda Area, California. BY LAWRENCE E. WELCH, RICHARD C. HUFF, RICHARD A. DIERKING, TERRY D. COOK, LELAND A. BATES, AND WELLS F. ANDREWS. 95 pp., illus.; maps 3.17 inches to the mile (1:20,000).

Gaines County, Texas. BY WILLIAM H. DITTEMORE, JR., CAREY MAY, WILLIS L. DELOZIER, DONALD L. MCCLENNON, AND HAROLD W. HYDE. 1965. 55 pp., illus., maps 3.17 inches to the mile (1:20,000).

Fayette County, Alabama. BY JAMES A. COTTON, R. B. McNUTT, G. L. HICKMAN, AND K. E. FUSSELL. 1965. 117 pp., illus.; maps 4 inches to the mile (1:15,840).

From the Administrator:

The World Is Our Horizon



IN THESE changing times, the soil conservationist is more important than ever before in helping plan for wise and balanced use of our land resources.

The individual conservationist and the individual landowner form a team that shapes critical decisions about each individual piece of property. For good or for bad, the sum of their actions is the Nation's true performance in conservation.

To an increasing degree, the individual's actions on his own piece of land are affected by—and in turn affect—the national and the world demand for food products of the land.

The Soil Conservation Service provides a chain of communication between the individual and the world community. In the changing days ahead, that link can prove invaluable in achieving balanced shifts in land use without endangering basic resources.

FOOD IS a matter of growing concern in the world today. Our view, as individuals and as a Nation, of the situation is changing more rapidly than we realize. As we become involved, through international aid arrangements, in the problems of other nations, we see as never before the very threat of famine in many parts of the world.

A few months ago we were preoccupied with the burden of "surpluses" of farm commodities. We were aware that people in other nations suffered for want of these same commodities. We were aware, too, that the need was increasing as population multiplied everywhere. But we could not see how our own market could be freed soon of depressing oversupplies.

The outlook is changing already.

Acreage reductions have begun to be effective. Food for Peace efforts have found ways to move increasing volumes of grain and foodstuffs to areas of want. The carryover of wheat has been reduced to a reasonable reserve, and the Secretary of Agriculture has announced an increase in the wheat acreage allotment for 1967.

In announcing the increase, the Secretary noted that it was "the beginning of a new era in American agriculture."

It is new not only in bringing a change in the direction of our production efforts, but, more importantly, in that we are prepared to make it a *controlled* change.

In this new era of American agriculture, as the Secretary said, we will be able to gear production not only to the needs of our own people and to those who can pay dollars for our products—but also to the needs of those struggling to develop their own economies.

The 15 percent increase in acreage allotment is a considered judgment of the additional wheat needed to meet domestic and foreign needs in an orderly fashion. The translation of this national estimate into actual changes in land use on individual farms is the responsibility of the individual owners and operators.

The choice of *which* acres, in each case, are to be shifted from other crops—or even from other land uses—to wheat is critical. Will some of our perennial grassland, established with such care in the past decade, be returned to cultivation? Will additional acres of native grassland be put to the plow? Will we sacrifice a part of the new wildlife habitat and recreation areas that have been so enthusiastically welcomed by

urban users?

In these days of land use adjustment, the soil conservationist is needed on the planning team for every farm. Conservation districts and the SCS have a responsibility to see that every decision is made with full knowledge of capabilities and the comparative values of other possible land uses.

SELF-HELP by each nation is the key to victory over hunger. Increasing production in the United States can help, but it cannot make up for all the shortages in other countries. Neither can it hope to keep pace with the staggering growth of world population.

Soil conservation as a basis for efficient farming must become a way of agriculture in every country that hopes to meet the needs of its people for decent nutrition.

This truth was recognized in the recent Pan American Soil Conservation Congress in Brazil, in which conservationists from the United States exchanged ideas and experiences with leaders from other Western nations.

Such meetings do much to prepare the way for widespread adoption of practical conservation measures in all lands. More important, I believe, than the information exchanged in the formal papers is the establishment of personal relations between conservationists in different nations.

Such relationships extend the lines of communication from the hundreds of individual conservationists in constant contact with landowners in this country to their counterparts throughout the world. They are reinforced by the presence of SCS people working on international aid projects abroad and by visits of professionals and students to this country.

As our horizons broaden to encompass the world community, each of us becomes a wiser consultant to landowners making day-to-day land use decisions.

D. A. WILLIAMS



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The Beauty of Rural America

See page 282



America the Beautiful—CONTOUR STRIPCROPPING, HARFORD SOIL CONSERVATION DISTRICT—USDA: SCS
MARYLAND

The "America the Beautiful" photo exhibit—one picture for each State, Puerto Rico, and the Virgin Islands—has been reproduced in full-color lithographs suitable for framing. Prints are available from the Superintendent of Documents for 10 cents each or \$5.00 for the complete set. Order blanks can be obtained from local Soil Conservation Service offices and at most post offices.